

Bringing **History** to Life



**Battle of  
Hastings**



**Hitler is  
chancellor**



**9/11 shakes  
the earth**



**Black death  
is rampant**



# EVENTS

## THAT CHANGED THE WORLD



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# PLAGUES, WARS AND CARS HAVE CHANGED HISTORY

In the 1300s, the Black Death swept through Europe. The plague killed over 25 million people leaving many areas barren.

In 1913, industrialist Henry Ford introduced the assembly line, his Ford car plant putting out a new car every nine seconds. Hitler seized power in Germany in 1933 - this led to WWII, which plunged humanity into six years of horror. History's crucial moments have been triggered by disasters, inventions and wars. In this issue of Bringing History to Life, we look at the events that have changed the world forever.

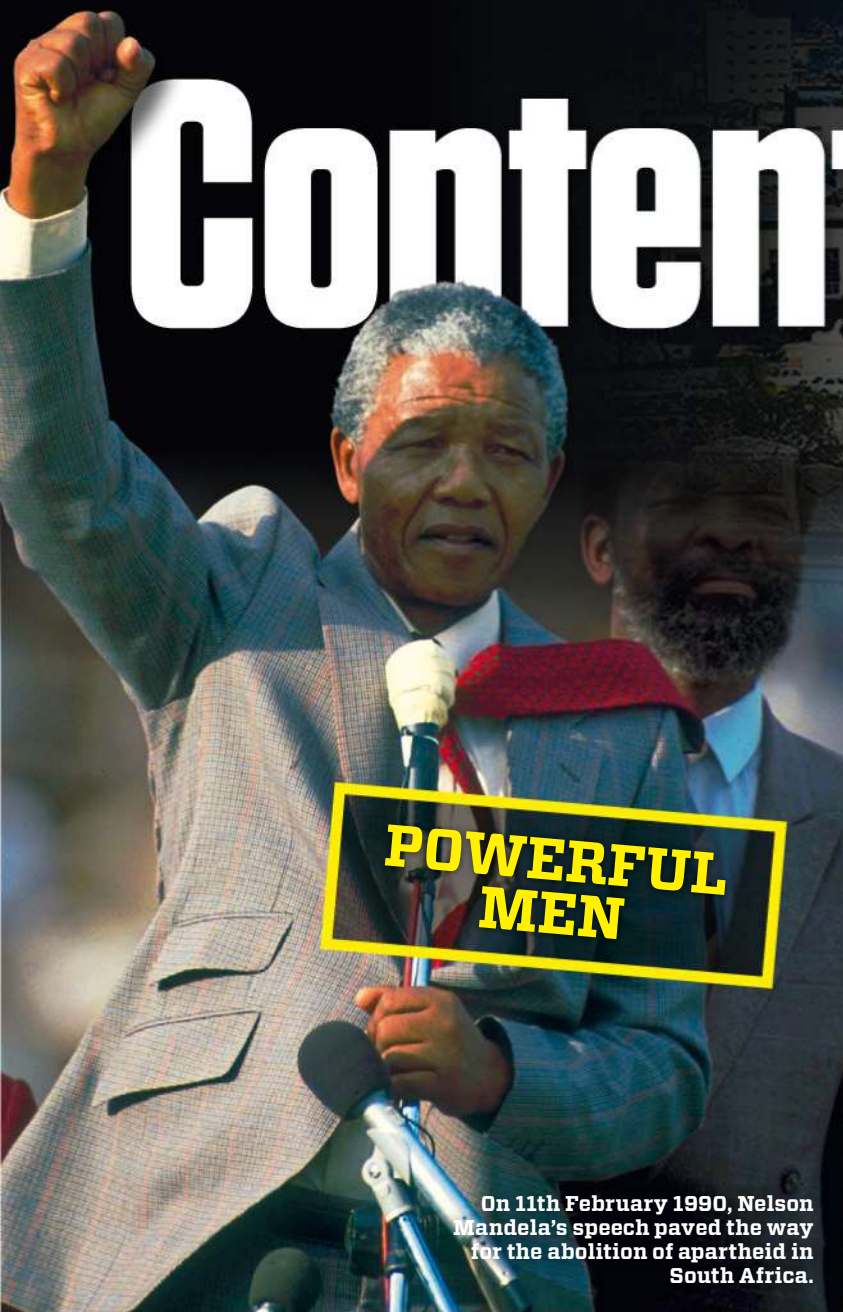
Read on - and learn.



*Hanne-Luise Danielsen*  
Hanne-Luise Danielsen  
Editor-in-Chief



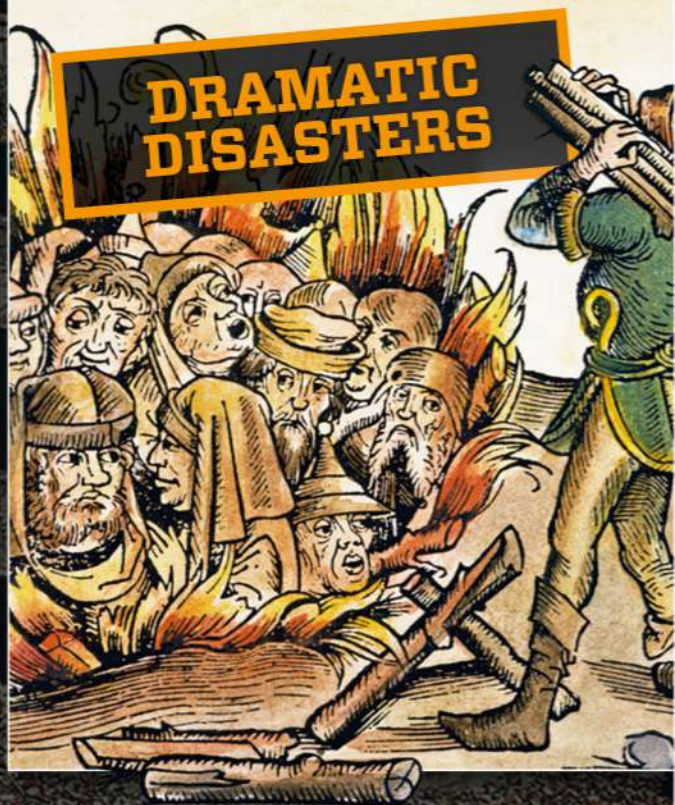
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On 11th February 1990, Nelson Mandela's speech paved the way for the abolition of apartheid in South Africa.

Throughout Europe, Jews were blamed for the plague and burned to death in their thousands.



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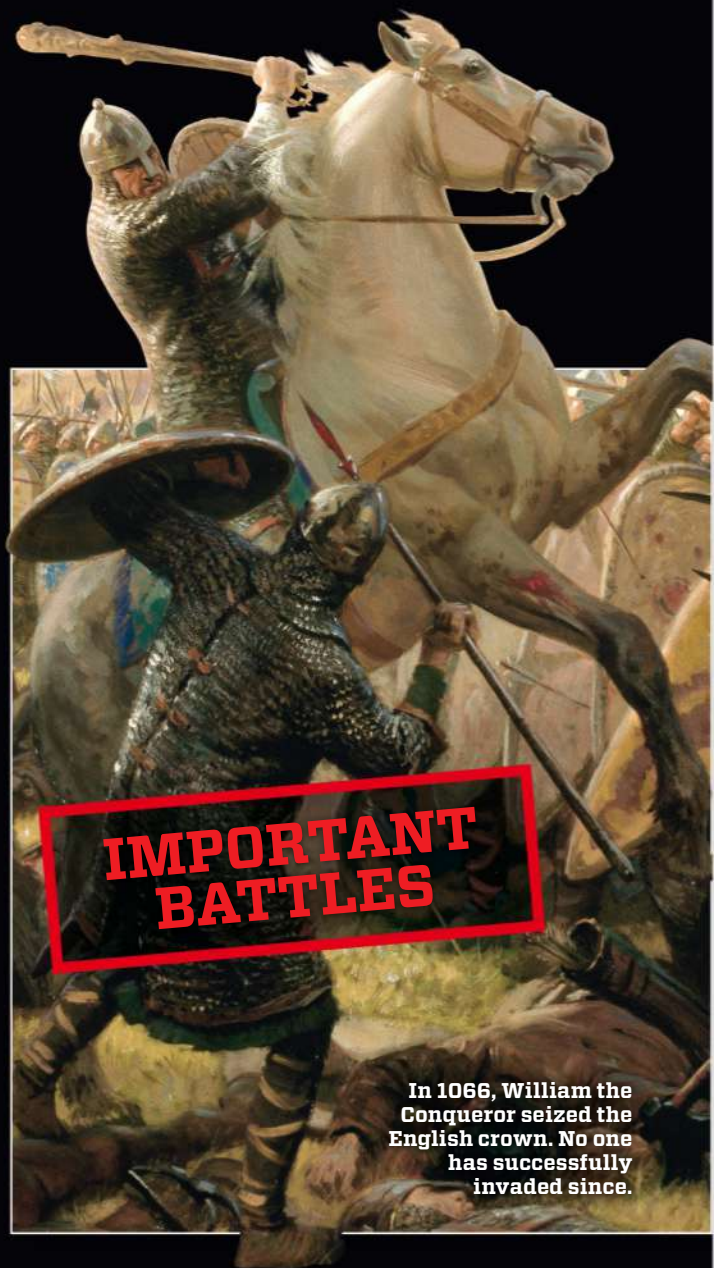


According to eyewitnesses, Richard Pearse was the first man in the air, but he let Wright Brothers take the credit.

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**POWERFUL  
MEN**

# FOLK HEROES AND DICTATORS

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Alexander the Great was a genius on the battlefield, while Hitler's talent was expressed at the podium where he seduced the crowds. Gandhi and Jesus gathered followers with more peaceful goals. Leaders have changed the world by brute force or with their strong ideas.

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# GENGHIS KHAN

## takes the east in a bloody war

*In 1206, Genghis Khan becomes ruler over all Mongol tribes. In record time, he creates one of history's strongest armies and engages in a bloody war of conquest, based on terror and murder. In just 25 years, his steppe warriors conquer more land than the Romans managed in 400 years.*

YU SHAN & GETTYIMAGES







MONGOLIAN  
EMPIRE

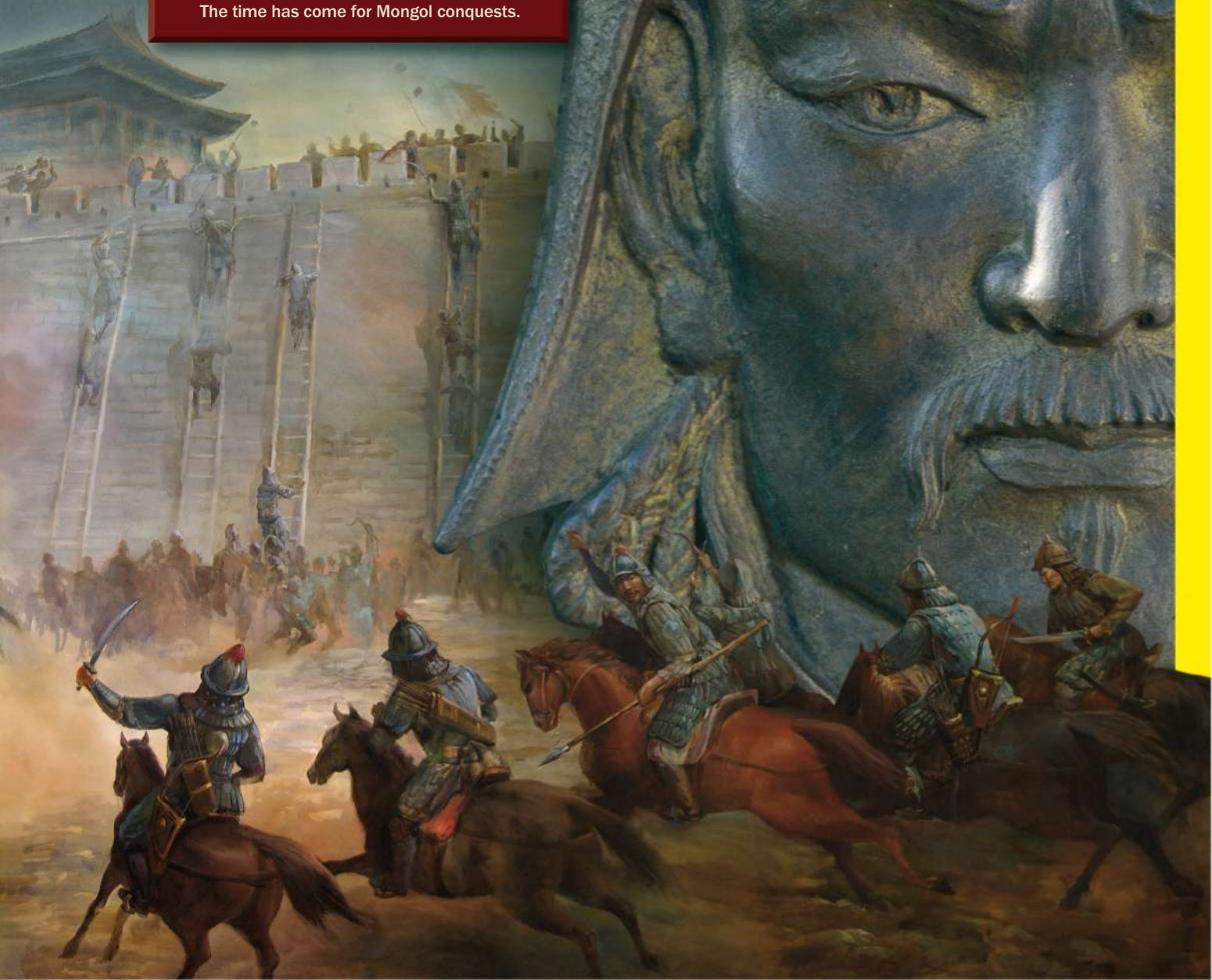
1206

## MONGOLIA REUNITED

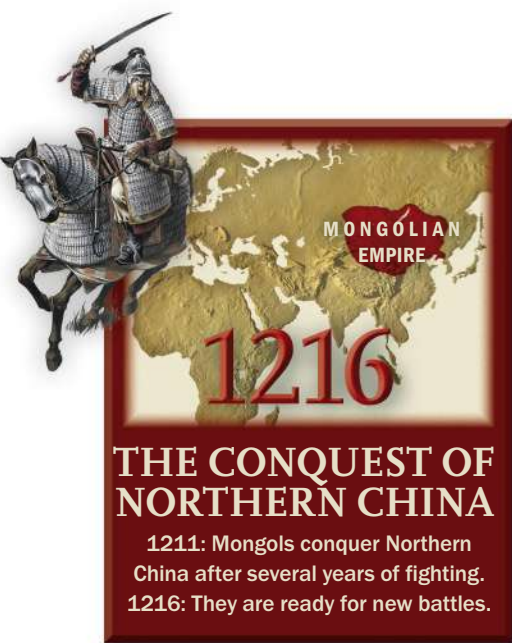
1204: after nearly 20 years of internal wrangling, Genghis Khan successfully crushes his opponents in Mongolia.

1206: he is proclaimed the Mongol ruler: Khan.  
The time has come for Mongol conquests.

*Genghis Khan's greatest achievement was the conquest of Northern China. Mongols rampaged through the cities for five long years.*







BY JAN INGAR THON

**B**ukhara was in flames. The one-time capital of the mighty Khwarezm, present day Uzbekistan, had been equal to Baghdad in its beauty, wealth and population. But in 1220, Mongol armies came like a storm from the plains to the east, crushing

everything in their path. Much of the city was torn to the ground and on the streets were piles of bloody corpses.

In the city's mosque, several hundred of the city's most powerful men huddled together on the floor in fear, waiting for the Mongol leader, Genghis Khan. Around the room parchment, papers and pieces of leather were strewn, as Genghis Khan had ordered that the box containing the holy Koran be emptied and used as a feeding trough for the Mongols' horses. And now the holy books had been trampled underfoot by the horses' hooves.

Genghis had grown up in a tent on the Mongolian steppes poor, marginalised and fatherless, yet, here he stood, with Central Asia's mightiest kingdom at his feet as punishment for its rulers, who had killed his messengers and merchants. As Genghis Khan entered the mosque, he looked over Bukhara's most powerful men huddling together in front of him. He walked through the room, up to the pulpit and

admonished their failures: "The most powerful amongst you have committed sins. If I had committed sins like yours, God would never have sent someone like me to inflict my punishment".

Under guard, he sent the men home, with orders for them to return with their riches.

The last cities in Khwarezm surrendered immediately after hearing the rumours of the Mongols' carnage and degradation in Bukhara. Genghis Khan took the greater part of his army and crossed into Afghanistan and onto North India. The rest of the army travelled through Caucasus and into Russia. Nothing could stop Genghis Khan's steppe warriors.

### Genghis' family was banished

When Genghis Khan conquered Bukhara in 1220, the Mongol ruler and his armies had already taken territory stretching nearly 6,000 kilometres from the Caspian Sea in the west to the Sea of Japan in the east.

Almost 60 years earlier, Genghis Khan was born into one the Mongols' most noble families; his birth name was Temudjin. According to "The Mongol secret history" – the Mongols' oldest literature, written a few years after Genghis Khan's death – his grandfather had been the Khan of all Mongols, and his father was governor. When Temudjin was nine year's old, his father died. It was thought he had been poisoned and as the eldest son, Temudjin was first in line to become Chief. But he was only a child and other Mongol families seized power, banishing Temudjin and his family.

The Chief's son grew up in poverty, yet somehow the family survived. Temudjin's harsh upbringing made him tough and as the years passed, the desire to avenge his family's humiliation grew inside him. When Temudjin was 13, he killed one of his brothers during an argument. Growing up had taught him the steppes' merciless law: if you want something, you take it!

### Temudjin gathers Mongols

As the years passed, Temudjin emerged as a leader within his tribe. But nomadic society was marked by rivalry, raids and bloody revenge, and again Temudjin had to leave because other tribe leaders had sent henchmen to kill him to eliminate the perceived



*As a young man, Genghis Khan had to hide from his rivals so they couldn't kill him.*



## THE NOMADS

# Steppe warriors put family and horses first

**Genghis Khan was one of history's most effective and terrifying warlords. His army's success was down to its mobility and self-sufficiency.**

**M**ongol society was held together in a complex network of extended families, tribes and clans, often warring with each other until Genghis Khan united them under one ruler: him.

As nomads, Mongols were on the road for months at a time and were self-sufficient with everything from food

to shelter. Because of this, Mongol warriors were more mobile than other more contemporary armies.

The Mongols were dependent on grass for their thousands of horses, and they always chose routes with large grassy areas, so the horses could feed. As they marched, every warrior had

three to four horses with him, to carry his supplies.

Horses were not only used for transportation. The Mongols made cheese from the mare's milk and in an extreme emergency, they could open a vein and drink the horse's blood or – if necessary – even eat it.

### FIVE LEVELS OF SOCIETY

#### 1. FAMILY

*The basic Mongol unit was the family, led by the patriarch.*

#### 2. VILLAGE

*The village consisted of several related families.*

#### 3. CLAN

*Several villages with the same ancestry formed a clan.*

#### 4. TRIBE

*The clans grouped together and formed a tribe.*

#### 5. KHANATE

*The tribes joined together to make a khanate – a kingdom.*



*Mongols lived in large tents all year around, called a "ger". The tent was made of heavy fur, stretched over wooden poles and could be easily carried by horses.*



*The Mongols' hardy horses could survive conditions that would have beaten other breeds. Even during the harsh winters they could dig grass from under the snow.*

threat to their own power. One attack happened when Temudjin's family were camped at the foot of the Mongol holy mountain Burkhan Khaldun. Temudjin, who was now 20, escaped, but the attackers abducted his young wife and rode off with her.

For three days, Temudjin hid in the woods. During this time at the foot of Burkhan Khaldun, Temudjin had a revelation: the gods had spared his life as his destiny was to become the next Mongolian leader. He would bring the scattered Mongolians together and unite them all under his leadership. Together they would conquer the world. In the following months, Temudjin allied with

several other tribes and together they attacked the tribe who had abducted his wife. Victory was theirs and Temudjin returned with his consort.

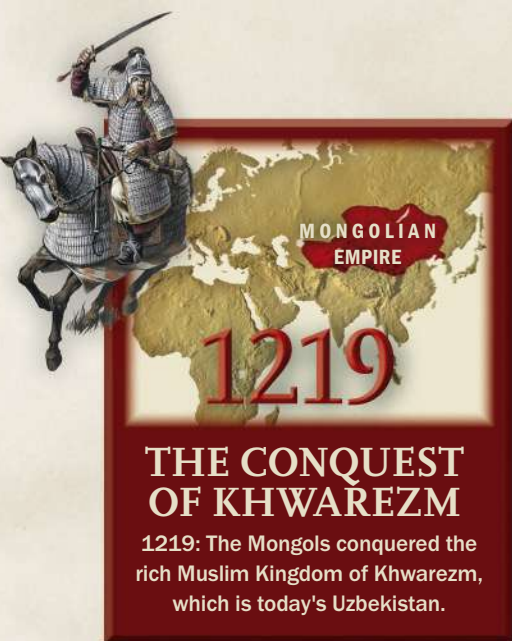
It would take 20 years of alliances, intrigues and war before Temudjin brought the Mongols together. In 1204, enemy tribes prepared to attack Temudjin's army camp on the plain below their lookout. The night before, Temudjin was prepared. He ordered every one of his soldiers to burn five campfires, confusing the enemy into thinking he possessed significantly more men than in reality. Enemy sentries reported that Temudjin had more soldiers than there were stars in the sky.

When morning came, Temudjin's warriors were met by an army who had pretty much already accepted defeat. By the end of the day, Temudjin stood victorious. In 1206, the Mongol's Supreme Council "Khural" gathered at the Blue Lake in the Arhang Mountains to proclaim Temudjin, absolute monarch of a united Mongolian people and give him the honorary title of Genghis Khan: ruler of the universe.

### A nomad army is created

As he struggled for power in Mongolia, Genghis Khan had started a military revolution that would transform the Mongols into the world's most feared ►





fighters. Genghis wanted the Mongols to live within their tradition and natural environment. As semi-nomadic shepherds they spent most of the year on horseback and were excellent riders; as hunters, they were also skilled archers. These skills would soon become the cornerstone of Genghis' new army.

Although the Mongols had always been a peaceful tribe, this "peace" had always been marked by perpetual feuds and guerrilla warfare, while cattle theft, kidnapping and murder were a regular part of daily life. In short, war was just an extension of Mongol routine.

As a young boy, Genghis had witnessed the inner conflicts between the Mongols and knew that there was no point trying to reconcile them. For his unification to work he needed to overcome them. So, systematically he set about wiping out the old tribe so he could start afresh with a willing, cohesive and unified army.

If they were skilled and brave, warriors could rise in the ranks regardless of their background. As a symbol of the new unity among the Mongols, Genghis created a guard of 10,000 men. He chose men from each of the Mongol tribes to ensure every one of them was fairly represented. The officer training was so good that those who went through it would have the skills and confidence to lead any army regiment in the future.

### Speed is the key to success

The steppe people quickly became masters of cavalry and embraced the freedom it gave them. They rode in

widely spaced scattered lines, making it easy for both men and horses to find food along the way. Yet, when necessary the scattered lines could merge for an attack in no time at all. Communication was key to success: messengers rode between troops keeping them in contact with each other. The messengers could travel almost 100 kilometres a day, changing horses when theirs became tired. It was only when the railway was introduced 660 years later that anyone or anything could surpass the Mongol messenger's rate of speed or distance.

Merciless tribal warfare had taught Genghis how important it was to know his enemy. So before any Mongol attack he would send spies to gather information or abduct enemies and interrogate them. He also sent scouts on horseback to check the lie of the land, so the Mongol soldiers couldn't be surprised by a hostile army. The scouts would ride 50-100 kilometres, both in front and to the rear of the army units and if they spied enemy troops they

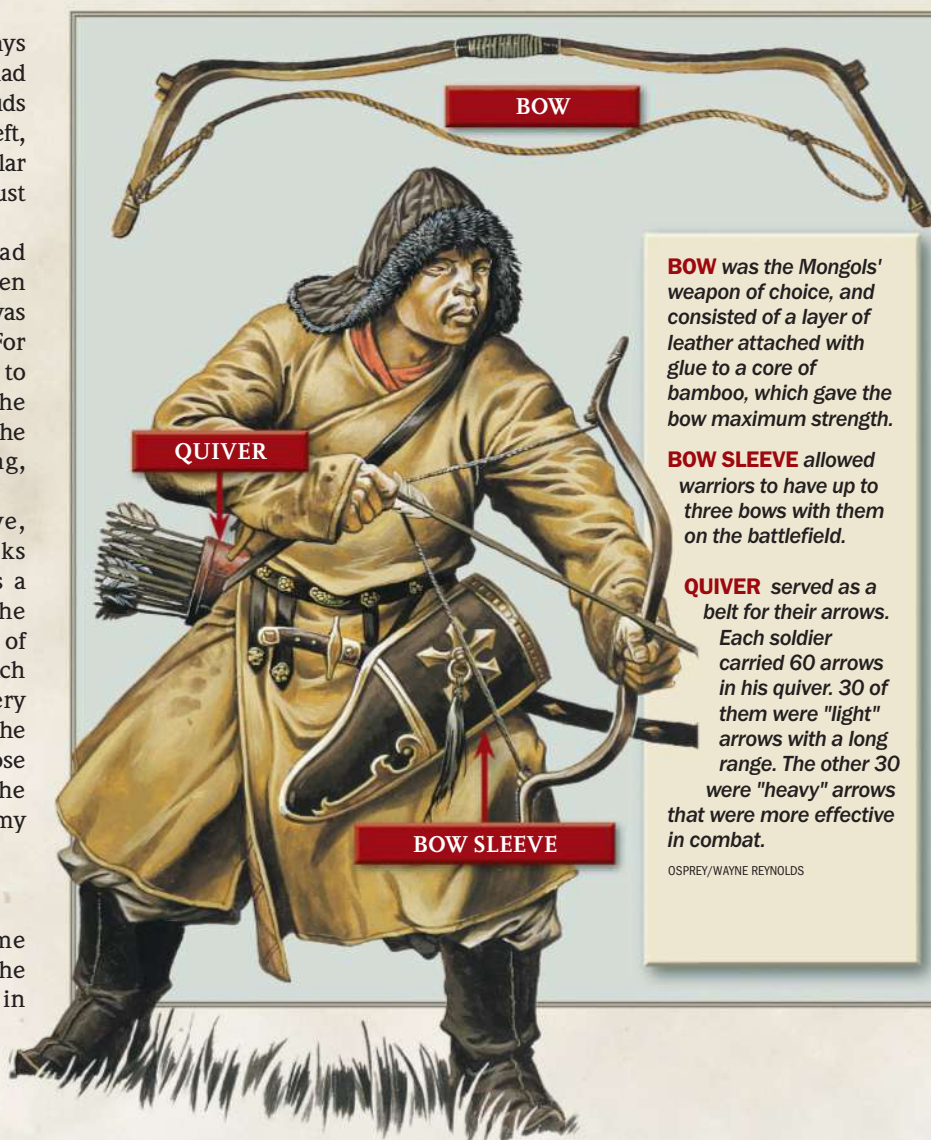
could quickly warn their own of the enemy's position and strength.

Genghis learned something else that would characterise Mongol warfare: caution. Unfettered bravery helps no one and only a fool fights a battle he knows he cannot win. However, when Genghis Khan crossed into China in the spring of 1211, many thought he'd lost his mind as they were certain this was a battle he couldn't win.

### The Mongols cross the Gobi desert

There were several reasons why Genghis Khan wanted to invade China; following his revelation at Burkhan Khaldun, he believed it was his divine calling. Yet, there was also a practical reason. The Mongols had no money and no economy – if they were able to overcome China, they would have riches beyond belief and Genghis would be able to reward his brave soldiers.

Genghis' spies had reported that conditions inside China were difficult. There were conflicts within the country



**BOW**

**BOW** was the Mongols' weapon of choice, and consisted of a layer of leather attached with glue to a core of bamboo, which gave the bow maximum strength.

**BOW SLEEVE** allowed warriors to have up to three bows with them on the battlefield.

**QUIVER** served as a belt for their arrows. Each soldier carried 60 arrows in his quiver. 30 of them were "light" arrows with a long range. The other 30 were "heavy" arrows that were more effective in combat.

OSPREY/WAYNE REYNOLDS



that made it weak. Yet, however weak it might be, it was another thing entirely to think that an army of nomads could overthrow a mighty civilisation like China with its army of hundreds of thousands of men. In addition, the Gobi desert lay between the Mongols and China, and was considered impossible to cross. But Genghis Khan believed he could. And in spring 1211 he led the entire Mongol army of about 50,000 men, through the desert and on to the border of Northern China.

### False escape fools the enemy

It seemed like the gods were on Genghis' side. The forts that should have kept the Mongols out had long since fallen into decline and Genghis simply rode past them. Despite being hugely outnumbered, they went on to crush one Chinese army after another.

Another effective tactic helped to secure this success: when scouts reported a hostile army or fortified

town, small units were sent ahead of the main group, riding right up to the enemy and then retreating as though they had lost their nerve. The enemy responded, riding in to retaliate and in the process, breaking up their carefully planned battle formations.

While this was happening, the Mongols' main army spread out into a horseshoe shape surrounding the enemy troops. The "fleeing" warriors drew the enemy tighter and tighter into the Mongols' trap and on the Mongol officer's command, the enemy was greeted by a hail of arrows as the warriors in the horseshoe closed in on them, attacking from all sides. The tactic worked, and the Mongols penetrated deeper and deeper into the country, leaving a trail of death and destruction in their wake.

Ahead now lay the greatest challenge: Zhongdu (now part of Beijing), a city with 350,000 people and enormous wealth. Zhongdu was surrounded by an

earth wall 15 kilometres long and 12 metres high, protected by 900 watch towers and defended by thousands of soldiers. With his usual caution Genghis chose not to attack the city directly. Instead, he laid siege, then sat and waited. There was no rush to go into battle. Merchants in caravans en route to Zhongdu had no idea that the city was under siege and one by one they fell to Mongol hands. No supplies were getting through to the city and people within the walls were starving.

### Zhongdu is burned down

While the Mongols waited, they learned something new from the Chinese ▶ prisoners and deserters: siege

## WEAPONS

# A nation of archers

**With their bow and arrows, Mongols on horseback could hit targets 600 metres away. They also had a heavy armour-protected cavalry.**

Mongolian warriors' bows were famous for their strength and had a range of up to 600 metres, which was almost double the reach of the famous English longbow.

The experienced steppe warriors could fire their arrows sitting on a horse at full gallop. The bow was a fearsome weapon: the arrows flew through the air at a speed of over 300 kilometres per hour, equivalent to about a quarter of the speed of a pistol bullet. However, because of the arrow's greater weight it had a much greater force than the bullet. At about 100 metres, arrows could penetrate through wood several centimetres thick, and could also penetrate the enemy's breastplates.

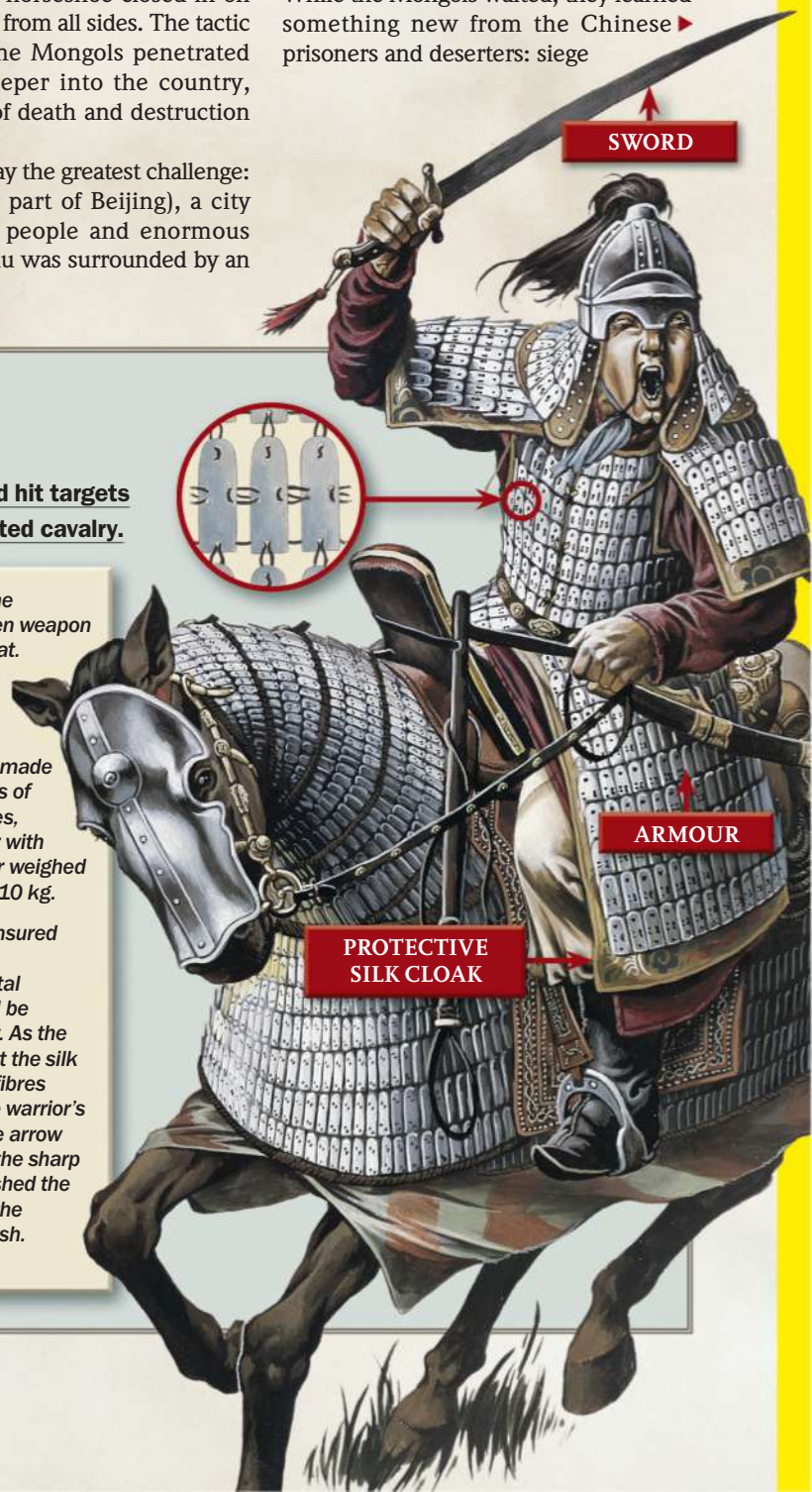
The Mongol army was made up of lightly armed archers on horseback and big divisions of heavy cavalry, armoured and armed with swords, spears or axes, which could be deployed in close combat.

**SWORD** was the Mongols' chosen weapon for close combat. It was slightly curved like a sabre.

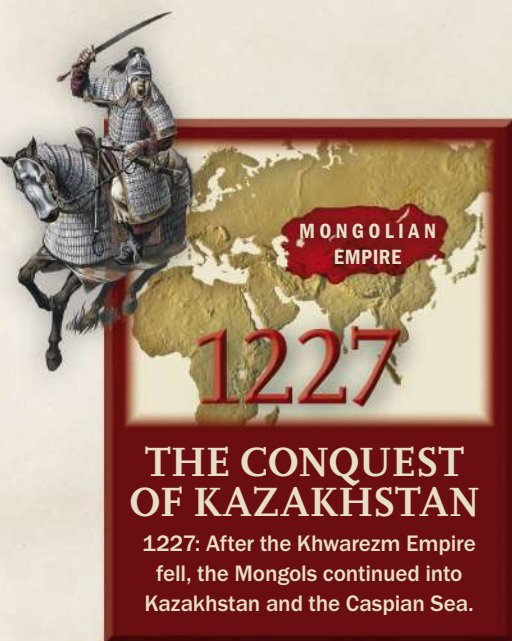
**ARMOUR** was made up of thousands of tiny metal flakes, bound together with leather. Armour weighed approximately 10 kg.

**SILK CLOAK** ensured that as arrows penetrated metal armour it could be removed easily. As the arrow hit, it met the silk fabric's dense fibres before it hit the warrior's flesh. When the arrow was removed, the sharp arrowhead slashed the fabric and not the surrounding flesh.

OSPREY/WAYNE REYNOLDS







tactics. It wasn't long before they'd mastered this type of warfare too. Eventually the Mongols felt ready to attack and they moved towards the city's defences. But when they reached the wall they were met by an arsenal of the Chinese's most deadly weapons: burning arrows, wax fireballs, ceramic bombs filled with thousand-degree hot liquid iron, and toxic fire bombs filled with petrol, all of which rained down on the Mongol warriors. But the Mongols thought quickly and as they still held thousands of Chinese prisoners from their earlier battles, they forced the prisoners to carry their ladders to the city walls.

Many of the Chinese within the walls recognised their family and friends carrying the ladders and hesitated. It didn't stop them for long though and the onslaught of arrows continued to rain from the defenders inside the city, killing their countrymen on the other side. Nevertheless, the ladders hit their spots and hoards of Mongols stormed the walls.

For more than a month the Mongols burned and looted Beijing. Several months later, a foreign

*In Europe, rumours spread that Genghis Khan was a descendant of the three wise men who, according to the bible, took gifts to Jesus.*

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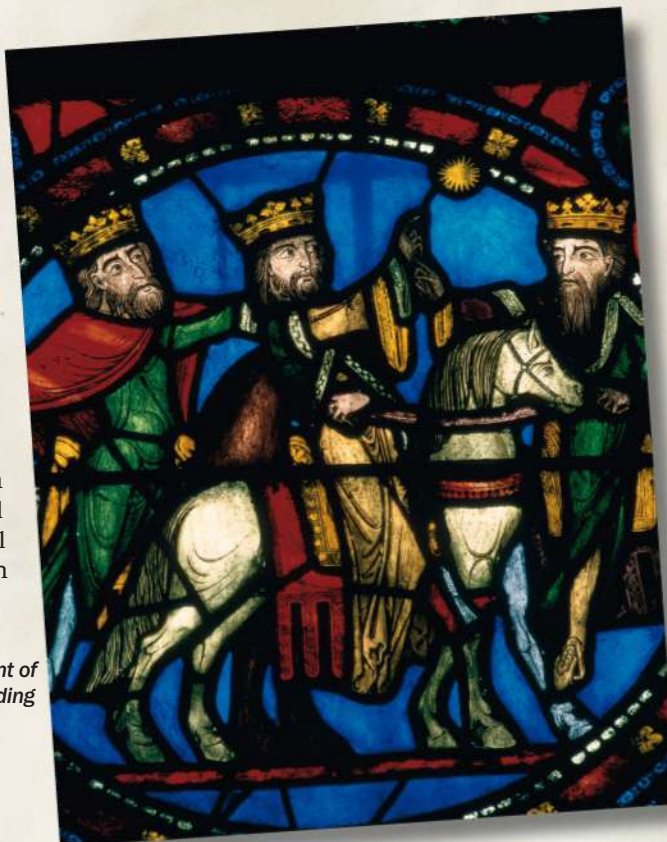
minister who visited the city announced that it was surrounded by mountains of bones, while the streets were covered in fat from the decomposed bodies of people who had perished in the flames.

#### **Tolerance holds kingdom together**

Genghis' Chinese onslaught lasted for five long years, at the end of which he had conquered most of northern China. The Mongols benefitted from Chinese wealth, but also gained a greater treasure: they learned how the rich managed things. Educating themselves about organisation and rules, the Mongols were now able to write their own laws.

The Mongols had no written language themselves; they used the written skills of their allies, the Naimans. Genghis appointed a Naimans scribe to write the Mongol Laws, the Yassa. Then he instructed his half brother Shigi to make sure that all of their laws and punishments were written on white sheets in a blue book. This would become "The Blue Book" of Yassa.

The Mongol Empire was one of history's most complex, and tolerance and religious freedom were prerequisites for its success. Freedom of religion was enshrined in Yassa: "He [Genghis] has decreed that all religions should be respected and that no precedence be given to any of them".



While Genghis Khan organised his new giant kingdom with its laws and regulations, he began to send messengers to Asia's other great empires with offers of peace and business opportunity. In the year 1207 he also sent a trade caravan to the Muslim Khwarezm in the west. Khwarezm was a rich country and stretched all the way from the Caspian Sea to India.

In the city of Otrar, a Mongolian trader was arrested on suspicion of espionage. Genghis wanted trade, not war, so he sent three messengers to find out what was going on. Instead, the entire trade caravan was murdered and beheaded, and their heads sent back to Genghis. Sources said that as soon the Mongol ruler received the severed heads, enraged, he went into the mountains, where bare headed he bowed toward the ground saying, "I did not want this dispute; give me the strength to take revenge".

After three days and nights on the mountain Genghis came down and told his men: "let's ride against the people of Islam and take our revenge!"

#### **Khwarezm is crushed**

In 1219, 150,000 Mongolian soldiers marched against the Muslims in Khwarezm. It was an army, the likes of which no one had ever seen before.

Each soldier had two or three horses, and 10,000 of them brought heavy war machines, carried by oxen and camels or rolled out on massive wooden wheels. They had battering rams, catapults, siege ladders and enormous siege bows that could shoot a hole in the fortress walls from a kilometre away. It was a formidable army that combined nomadic movement with siege weaponry.

The vast Mongol force marched, insatiably devouring every country it passed through. As it moved on, its number grew, swelling the size of the magnificent army. As each territory fell, the ranks were reinforced with slaves and conscripts. It was an immense unstoppable beast that finally broke through the borders of Khwarezm. "The air was



# Mongols fought a psychological war

**Fear can force even the strongest enemy to its knees. The Mongols knew this and consciously built their reputation reinforcing fear among their enemies.**

The Mongols' brutality and bloodlust created fear and terror wherever they went. When Genghis Khan captured the city of Merv in Khwarezm kingdom, his troops slaughtered all of the city's 700,000 inhabitants.

The massacre was a carefully considered plan of psychological warfare as the Mongols knew that after the massacre no other city would dare face them, for fear of a similar fate.

In some cities, Genghis Khan ordered his men to kill all dogs and cats and demolish every wall so that the cities couldn't be rebuilt. By contrast, cities loyal to the Mongols that surrendered without a fight, were spared.

Their methods of intimidation were multiple. Even before battle they confused the enemy. Riders from the

rearguard would drag large branches to kick up dust, giving the false impression that they had many more troops.

During some sieges, the Mongols forced prisoners to put on Mongolian dress. The terrified prisoners were driven towards the city walls giving the enemy a false impression of the Mongols' overwhelming strength.

Their behaviour gave them the reputation of being barbarians, but it didn't worry Genghis Khan, who, according to a Persian source founded his empire on a simple philosophy: "The greatest happiness is to scatter your enemy, to drive him before you, to see his cities reduced to ashes, to see those who love him shrouded in tears, and to gather into your bosom his wives and daughters".



**Mongol warriors showed no mercy to their enemies. They were notorious for their cruelty wherever they went.**



**After Genghis Khan's death, Mongol armies continued using terror tactics; particularly when they rampaged through Poland in 1241.**

SCANPIX/AGK-IMAGES

black as night from the dust kicked up by the horses," a Persian onlooker described. "Fear and panic overwhelmed, and terror reigned".

News of the Mongols' invasion of Khwarezm reached Europe. Stories circulated that there would be a mighty Christian ruler in Asia. He would be a descendant of the three wise men and would come to Europe to save them. Many believed that Genghis was that ruler and had come to help in the fight

against the Muslims. The dream was shattered just four years later, when the Mongols attacked Christian Europe too.

The first city in Khwarezm to be attacked was Otrar where the Mongol messenger had been killed. Before the Mongols came, Otrar had been a thriving commercial centre. As they passed through, the town was so badly destroyed that it would take 800 years before archaeologists found any trace of its existence. Next were Khwarezm's



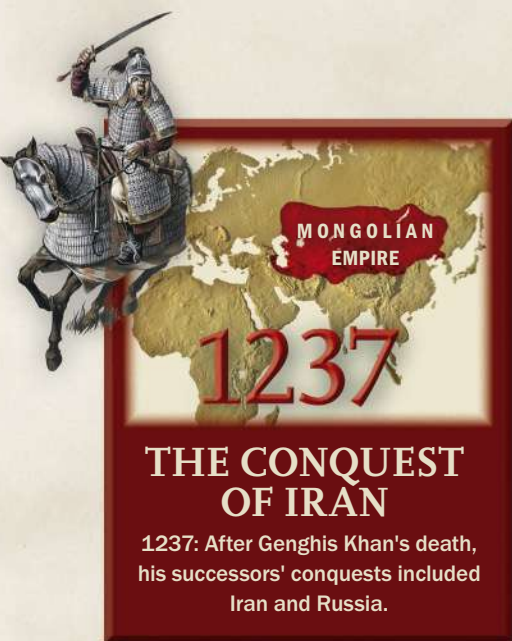
**The city of Merv was large and affluent. When the Mongols conquered the city in 1221, they left it in ruins.**

other major cities: Bukhara, Samarkand and Gurganj. In Gurganj each Mongolian soldier was ordered to kill 24 people – the Mongolian soldiers numbered 50,000 men.

## Asia's pearl left desolate

Finally, there was only one major city left, Merv. It was known as "Asia's ►





pearl” and its ten libraries contained 150,000 books. The city was also famous for its magnificent palaces and canals. The garrison consisted of 12,000 men and the city was a refuge for 700,000 civilians. It was clear how effective the Mongol terror war was. And after a half-hearted attempt to defend the city, both soldiers and civilians shut themselves in their homes and awaited their fate. It took four days to drive the population out of the city.

“Merv’s population was shared out amongst the soldiers, and each man was ordered to kill 300 or 400 of them”, the

Persian historian Djuvaini noted. After the steppe warriors had left the city, a Muslim cleric and his followers turned up. They spent 13 days counting up the number of dead.

The Mongols appeared to be unstoppable, and now they stood on the Indian border. Yet instead of continuing into India, their attention turned to the west – towards Europe.

### 80,000 Russians slaughtered

After victory over the Khwarezm Empire, the Mongol army continued northwest. They had heard of a nation called Bulgarians, who were Muslims allied with Khwarezm and also rich because of the fur trade. Armed with this knowledge, under the leadership of Genghis’ most experienced general, the one-eyed Subutai, they headed for Bulgaria. The army crossed the mighty Caucasus Mountains, defeated the Kingdom of Georgia’s armies, and stood on the banks of the River Dnieper.

Now the Russians were mobilised. Mighty princes from Kiev, Kursk and Rostov allied with the Polovstian people from Turkey and on 31st May, 1223, they met Subutai at the Kalka River. After the battles, the Mongols had crushed 80,000 Russian soldiers. Six



*On his deathbed, Genghis Khan called his sons and divided the vast empire between them.*

Russian princes and 70 noble men were among those killed.

Instead of marching towards the heart of Europe, they travelled north up the Volga towards Bulgaria where Subutai’s army finally met fighters made from the same mould. The Bulgarians were descendants of Turkish horse tribes and ruled their land using the same war tactics as the Mongolians.

The two armies met in the autumn of 1223. The Bulgarians acted out the play and feigned retreat, and the Mongols followed, certain of victory. However, at the Samara River the Bulgarians ambushed and defeated the Mongol army with its own resources.

The Mongols had tasted Europe and witnessed its riches. They also learned that European armies could be defeated, just like the Chinese, Tatar and Turkish ones. The Mongols would revisit Europe after Genghis’ death.

### Genghis Khan’s death was a secret

Four years after the battle against the Volga Bulgarians, Genghis Khan died aged 65 – possibly of pneumonia. According to legend, the last words to his sons were: “I created a large kingdom, but life was too short to conquer the world. I leave that to you”.

Fearing chaos and infighting, Genghis’ death was kept secret. Legend has it that anyone who saw the funeral procession was killed, including soldiers who attended, lest they should reveal the steppe ruler’s final resting place. It’s never been found.



### Genghis Khan has 16 million descendants

During the Mongol campaign, women were considered to be an accepted spoil of war. And Genghis Khan took a new wife in every city that was conquered during the campaign in China. In 2003, when studying the DNA of 2,000 European and Asian men, researchers discovered the same DNA profile in 16 different ethnic groups from the Pacific Ocean to the Caspian Sea. More than 16 million were from the same family and from an area ravaged by Mongolians. They found that the original DNA came from someone from Mongolia in the 1100s; maybe all 16 million are descendants of Genghis Khan.

*The potential number of Genghis Khan’s descendants is around 16 million.*

### FURTHER READING

• John Man: *Genghis Khan – Life, Death and Resurrection*, Bantam Press 2004 • Leo De Hartog: *Genghis Khan: Conqueror of the World*, Tauris Parke Paperbacks 2003 • Timothy May: *The Mongol Art of War*, Pen & Sword Military 2007



## Genghis' descendants ruled the world

**After Genghis Khan's death, his descendants continued to grow the Mongol Empire until it was twice the size of the Roman Empire. It was history's largest connected empire.**



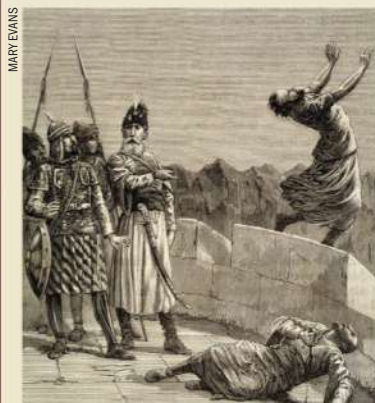
*The famous Venetian merchant Marco Polo supposedly met Genghis Khan's grandson Kublai in China.*

### YUAN DYNASTY

After his death, the greater part of Genghis Khan's kingdom fell to his son Ogotaj. He was given most of East Asia and China and was named Great Khan, becoming leader of all the Khans from other kingdoms. Under the command of Genghis Khan's grandson Kublai Khan, South China was also added to the kingdom and in 1271, Kublai founded the Yuan dynasty. Kublai Khan tried unsuccessfully to invade Japan. In 1368, the last Mongol ruler of China died.

### CHAGATAI KHANATE

Genghis Khan's son Chagatai inherited land comprising modern-day Uzbekistan, Kyrgyzstan, Kazakhstan and Northern Iran. The empire was later known as the "Chagatai-Khanate". In the early 1300s many of the new Mongol rulers converted to Islam, against all Mongol tradition, which led to major revolt. After this, the empire began to fall apart and Mongol rulers moved to Uzbekistan, where they remained until the 1700s.



*En route to Baghdad, the Mongols defeated the infamous assassins who lived to kill.*

### IL-KHANATE

In 1256, Genghis Khan's grandson, Hulagu, founded "Il-Khanate", which included present-day Iran, Iraq, Armenia, Afghanistan and Eastern Turkey. Hulagu led many conquests and crushed Islam's two most powerful centres: Baghdad in modern Iraq and Damascus in modern Syria. Hulagu tried to conquer Muslim Egypt, but his army was overrun on its way through Palestine. In 1353, the last of the Il-Khanate was killed and the kingdom dissolved.

### THE GOLDEN HORDE

Under the command of Genghis Khan's grandson Batu, Mongols invaded Europe once again. In 1238 Moscow was defeated, and in 1240 Kiev fell. A year later the Mongols defeated a large Polish army at Liegnitz. The Mongols stood at the border of the German Reich in the heart of Europe, but in 1242 they

withdrew because Ogotaj had died. Nine years later Batu founded the Golden Horde kingdom, which included today's Russia, Ukraine and Moldova. Here, the Mongols instructed Russian princes to collect taxes on their behalf. In the early 1500s, the Golden Horde lost its power in the region.



# History's in

*In many cases, a few well-chosen words have changed the course of history. Before any major battle, Queen Elizabeth I instilled her soldiers with a fighting spirit, and John F Kennedy won the hearts of Berliners with a single sentence.*

BY SUSANNE KNUDSEN

**The German pastor Martin Luther rebelled against the powerful Catholic Church.**

AKG-IMAGES

## "God help me, amen"

### MARTIN LUTHER

## Heretic church was split

**18th April, 1520, Worms, Germany.**

**Background:** in 1520, Luther was excommunicated by the pope for having criticised the Church's material interests. Subsequently, he had to defend criticism from the Holy Roman Emperor Charles V.

**Extract:** "No one can either deny or conceal this, for universal experience and world-wide grievances are witnesses to the fact that through the

*Pope's laws and through man-made teachings the consciences of the faithful have been most pitifully ensnared, troubled, and racked in torment, and also that their goods and possessions have been devoured... I cannot and will not recant anything, for to act against our conscience is neither safe for us, nor open to us. On this I take my stand. I can do no other. God help me, amen."*

**Consequences of the speech:** Luther's words made an impression on the nation, but not on the Holy Roman Emperor Charles V who outlawed the rebellious priest, adding: "we want him caught and punished as the notorious heretic he is". Luther escaped with the help of powerful sympathisers and in the following years, the Catholic Church's power in Europe broke down to pave the way for Luther's Protestantism.



# the words



**"No hardships for Germans"**

PHOTO/ALISTEN BILD

## HITLER

### People were deceived

**1st September, 1939, German Reichstag, Berlin.**

**Background:** Hitler annexed Austria, occupied Czechoslovakia, and now it was Poland's turn. He blamed Poland for WWI, to legitimise the attack against the German people.

**Extract:** *"This night for the first time Polish regular soldiers fired on our territory. Since 5.45 AM we have been returning the fire, and from now on bombs will be met by bombs... There will be no hardships for Germans to which I myself will not submit. My whole life henceforth belongs more than ever to my people. I am from now on, just a soldier of the German Reich. I have once more put on that coat that was the most sacred and dear to me. I will not take it off again until victory is secured, or I will not survive the outcome."*

#### Consequences of the speech:

Poland's Western allies subsequently declared war on Germany, marking the beginning of WWII.

**"I may not harbour hatred against anybody"**

## GANDHI

### India gained its independence

**8th August, 1942, Gowalia Tank Maidan Park, Bombay.**

**Background:** in 1919, Mahatma Gandhi had supported British colonialists in India, despite his non-violent struggle for India's independence. Thousands joined his later campaigns, including the "salt march" in 1930, when his supporters marched 400 kilometres to the coast to protest against the British monopoly on the salt trade. British soldiers tried to stop the march and hundreds were killed. Gandhi maintained, that "Satyagraha" – passive resistance – was way forward and in 1942, he launched his anti-British "Quit India" campaign.

**Extract:** *"Let me hasten to assure that I am the same Gandhi as I was in 1920. I have not changed in any fundamental respect. I attach the same importance to non-violence that I did then. If at all, my emphasis on it has grown stronger... At a time when I may have to launch the biggest struggle of my life, I may not harbour hatred against anybody."*

**Consequences of the speech:** immediately after the speech, Gandhi and his political supporters were imprisoned by the British. Subsequent riots and strikes finally led to India's independence in 1947.

GETTY / ALL OVER PRESS

## ELIZABETH I

### Spanish Armada crushed

**9th August, 1588, Tilbury, South England.**

**Background:** Philip II of Spain sent his infamous armada against England. Sea battle ensued, inspiring Queen Elizabeth I's speech to encourage her fleet.

**Extract:** *"I know I have the body of a weak and feeble woman, but I have the heart and stomach of a king, and of a King of England too."*

**Consequences of the speech:** Elizabeth I showed strength, gaining her fleet's allegiance. Despite the Spanish fleet's superiority, the British averted a Spanish invasion.



**"I have the heart of a king"**

BRIDGEMAN

## LINCOLN

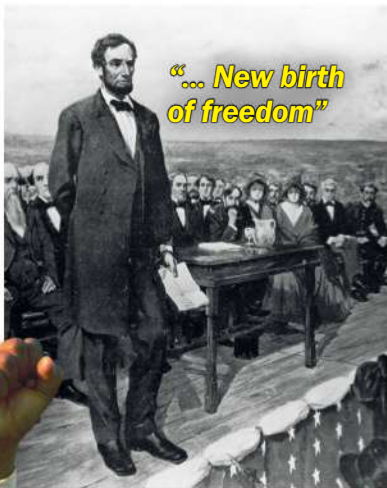
### Hidden message

**19th November, 1863, Gettysburg, Pennsylvania.**

**Background:** Abraham Lincoln was inaugurated at the cemetery near Gettysburg, the site of one of the American Civil War's bloodiest battles.

**Extract:** *"From these honoured dead we take increased devotion to that cause for which they here gave the last full measure of devotion – that we here highly resolve that these dead shall not have died in vain – that this nation, under God, shall have a new birth of freedom, and that government of the people, by the people, for the people, shall not perish from the earth."*

**Consequences of the speech:** in only two minutes, Lincoln hailed the dead and also outlined his vision for a united America.



## CHURCHILL

### RAF won "The Battle of Britain"

**4th June, 1940, House of Commons, London.**

**Background:** in the war's early years, hundreds of thousands of British and French soldiers were forced back to the French city of Dunkirk. From there they were evacuated to England. When the last soldier had been evacuated, the British Prime Minister Winston Churchill made one of his most famous speeches.

**Extract:** *"We shall go on to the end, we shall fight in France, we shall fight on the seas and oceans, we shall fight with growing*

*confidence and growing strength in the air, we shall defend our Island, whatever the cost may be, we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender."*

**Consequences of the speech:** three months later the Royal Air Force prevented the Nazis from invading the country and destroying the air force. Churchill praised and immortalised them with the words, "Never was so much owed by so many to so few".

## MANDELA

### Mandela abolished apartheid

**11th February, 1990, Cape Town, South Africa.**

**Background:** when Frederik de Klerk became president of South Africa, he released the leader of the African National Congress (ANC) Nelson Mandela, who had served 27 years in prison. Mandela spoke to his followers.

**Extract:** *"I have fought against white domination and I have fought against black domination. I have*

*cherished the ideal of a democratic and free society in which all persons live together in harmony and with equal opportunities. It is an ideal, which I hope to live for and to achieve. But if needs be, it is an ideal for which I am prepared to die."*

**Consequences of the speech:** in 1994, Nelson Mandela won the ANC presidential election becoming South Africa's first black president at the age of 75. He left the post in 1999.

*"An ideal, for which I am prepared to die..."*



## CATO

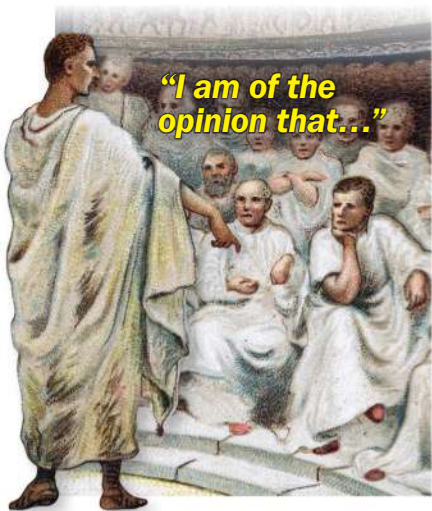
### Carthage is destroyed

**150 BC, The Roman Senate.**

**Background:** the Roman politician Cato was convinced that the North African city of Carthage threatened Rome's position of power in the Mediterranean.

**Extract:** *"I am of the opinion that Carthage should be destroyed."*

**Consequences of the speech:** Cato's wish came true after the Third Punic War of 149-146 BC, when Carthage was indeed destroyed.



## MARTIN LUTHER KING

### The dream of equality came true

**28th August, 1963, Lincoln Memorial, Washington DC.**

**Background:** the American preacher and civil rights leader Martin Luther King gave a speech for freedom and work for US minorities.

**Extract:** *"I have a dream that one day this nation will rise up and live out the true meaning of its creed: 'We hold these truths to be self-evident, that all men are created equal'."*

*"I have a dream that one day on the red hills of Georgia, the sons of former slaves and the sons of former slave owners will be able to sit down together at the table of brotherhood."*

*"I have a dream that one day even the state of Mississippi, a state sweltering with the heat of injustice, sweltering with the heat of oppression, will be transformed into an oasis of freedom and justice."*

*"I have a dream that my four little children will one day live in a nation where they will not be judged by the*

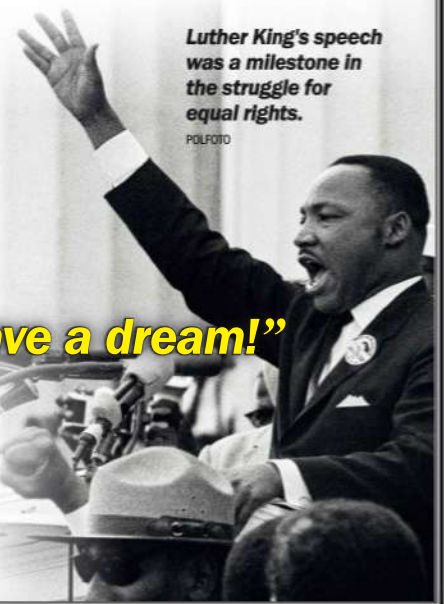
*colour of their skin but by the content of their character. I have a dream today!"*

**Consequences of the speech:** in 1964, the Senate passed a law ending racial segregation in the United States and Luther King was given the Nobel Peace Prize for his peaceful struggle for black Americans' rights. He was assassinated in 1968.

*Luther King's speech was a milestone in the struggle for equal rights.*

POLIFOTO

**"I have a dream!"**



## KENNEDY

### American President won the hearts of Berliners

**26th June, 1963, Town Hall steps, Schöneberg, West Berlin.**

**Background:** after the German Democratic Republic had built the Berlin Wall in 1961, the relationship between East and West was icy. President John F Kennedy visited West Berlin to try and strengthen the Western alliance.

**Extract:** *"Two thousand years ago, the proudest boast was 'civis Romanus sum'. Today, in the world of freedom, the proudest boast is 'ich bin ein Berliner'... When all are free, then we look – can look forward to*

*that day when this city will be joined as one and this country and this great continent of Europe in a peaceful and hopeful globe. When that day finally comes, as it will, the people of West Berlin can take sober satisfaction in the fact that they were in the front lines for two decades."*

*"All free men, wherever they may live, are citizens of Berlin. And, therefore, as a free man, I take pride in the words – ich bin ein Berliner."*

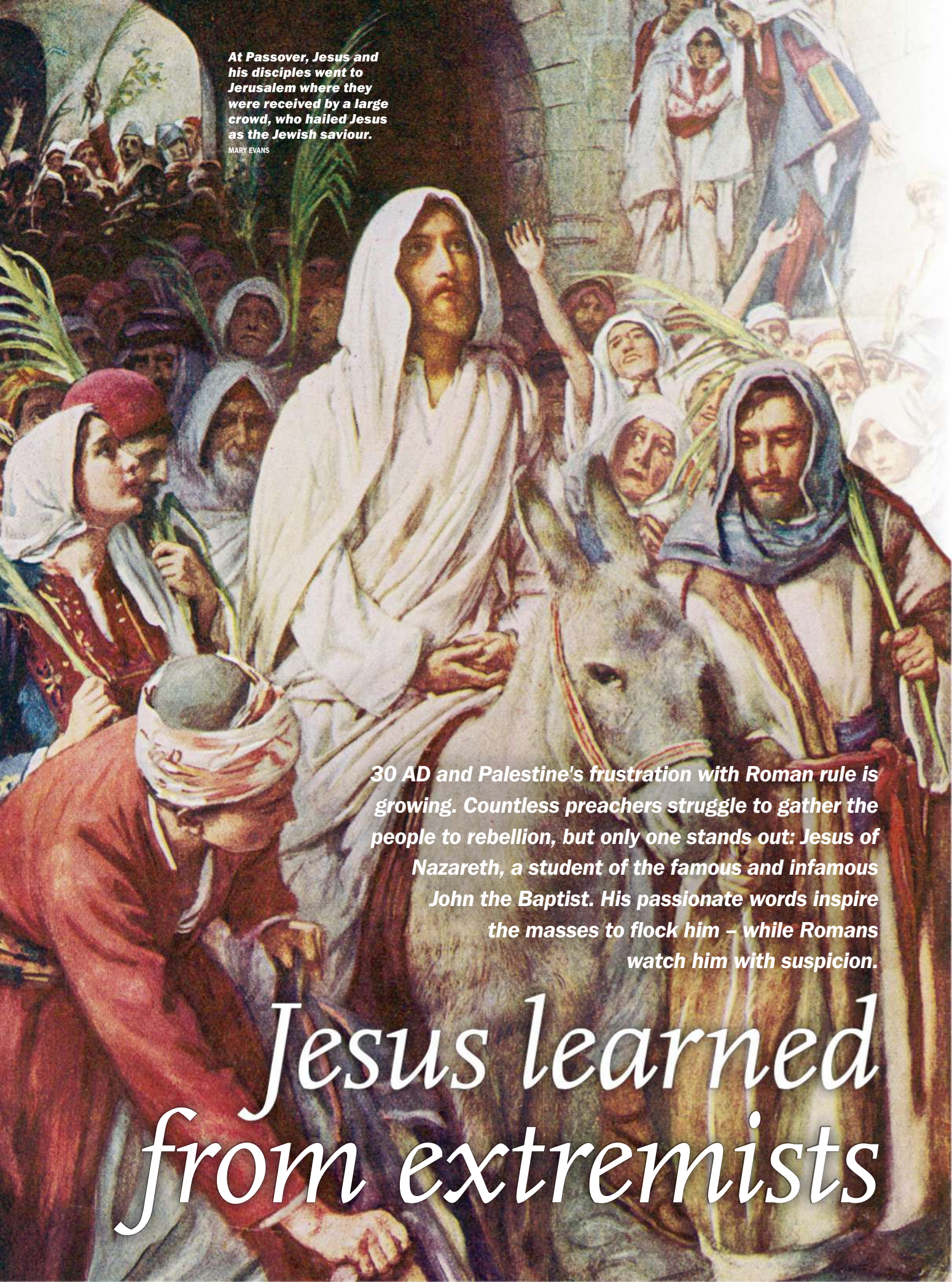
**Consequences of the speech:**

Berliners considered Kennedy's speech to be a promise that they would have support if there were another conflict with the Eastern Bloc. And after the speech, relationships between the Soviet Union and the Western Allies were a few degrees cooler.

**"Ich bin ein Berliner"**







At Passover, Jesus and his disciples went to Jerusalem where they were received by a large crowd, who hailed Jesus as the Jewish saviour.

MARY EVANS

30 AD and Palestine's frustration with Roman rule is growing. Countless preachers struggle to gather the people to rebellion, but only one stands out: Jesus of Nazareth, a student of the famous and infamous John the Baptist. His passionate words inspire the masses to flock him – while Romans watch him with suspicion.

# Jesus learned from extremists





The Mount of Olives is a peaceful spot. The view of Jerusalem's walls and towers are breathtaking and the evening air is clean and filled with scent. But all the beauty and peace is oblivious to Jesus. A cold dark feeling of dread clutches at his heart. The horror grows as he wanders down the winding, stony paths through the night. Although he is joined by three of his closest friends, he is still overcome by loneliness.

"My soul is exceeding sorrowful, even unto death: stay here, and watch with me", he insists. He goes away to pray one last desperate prayer to God to prepare himself for what he knows will happen. The idea of a slow death on a cross is almost unbearable. When he comes back, the others are sleeping. The night is waning.

Jesus' presence makes people nervous, and in Jerusalem they are both fearful and expectant of him. The town is about to celebrate the Passover and the streets are teeming with pilgrims from both near and far. The Romans in charge of Palestine are conscious of any sign of unrest and keep an especially close eye on Jesus: the carpenter from Nazareth has caught their attention. His followers are an odd bunch and are often heard saying that their God has chosen him to liberate Palestine. That kind of talk piques the Romans' interest.

Jesus knows that his days are numbered. Only a year ago, he and his entourage of fishermen and other humble acquaintances were relatively unknown, yet they are now seen as a threat to the mighty Rome. The penalty for this is an agonising death on a cross. In a peaceful grove on the Mount of Olives, he tries to come to terms with his inevitable fate.

#### Historical references to Jesus

According to the Bible, Jesus' life could not have ended any differently. Everything in his life points toward a special, divine destiny. The Gospels of the New Testament tell us that angels appeared when the baby Jesus was born and kings paid homage to the new baby with rich gifts. Later at the age of 12, Jesus visited Jerusalem with his parents and disappeared to discuss the Holy Scriptures with scholars in the temple. Historians can't find any evidence for this.

That Jesus lived, however, is not in doubt. In addition to the Bible he is mentioned in both Roman and Jewish sources from the 1st century. The Jewish historian Josephus describes a teacher and miracle worker by the name of Jesus, while Roman Tacitus tells of "Christ – as in Tiberius' tenure – was executed

by the governor, Pontius Pilate". Based on historical events mentioned in the Gospels, historians are able to roughly guess when Jesus was born, however they have no facts about his birth and childhood.

Researchers consider it most likely that Jesus was born in Nazareth, where his parents lived. St. Luke and St. Matthew mention that Jesus was born in Bethlehem, where his parents were raised and he was noted in the census because the family "were of the house of David". Historians find this information very unlikely. A census from the period around the birth of Jesus exists, but it was local and did not cover Galilee, which included Nazareth. Moreover, historians reject the idea that Jews were required to travel to the city of their ancestors. The Romans only spoke to Palestinians in order to tax them, which meant their current whereabouts was the only place of interest.

#### Jews were ruled with an iron fist

The fact that the Nativity is located in Bethlehem – the birthplace of King David – is probably because evangelists wanted to make an association between Jesus and King David. According to tradition, about 1,000 years before Jesus' birth the mighty king had gathered the area's 12 tribes and created a mighty empire. Israel under King David was rich and strong, and its people were happy. At the time of Jesus' birth, ancestry was important and by acknowledging a link between King David and Jesus, the evangelists' Son of God acquired the finest pedigree anyone could hope for.

Jesus was unlikely to be a descendant of David, but he probably had – like most Jews of his time – strong allegiance to Israel's legendary king, who had become a symbol of Jewish freedom. 500 years after King David's death, his empire fell due to internal conflict and greater powers were eager to acquire the fertile land in the region. Over the years, several rulers

*That Jesus lived is not in doubt. In addition to the Bible he is mentioned in both Roman and Jewish sources from the 1st century.*

came and went, while they filled their storehouses with grain, dates, figs and other bounty from King David's country.

In Jesus' time the powerful Romans controlled Palestine. They had taken the country about 60 years earlier and kept the ►



The entrance to the family tomb was discovered in East Talpiot in Jerusalem.

#### Christ's family tomb?

In 1980, construction workers found a grave while they were laying the foundation for a residential complex outside Jerusalem. The tomb was dated to 538 BC - 70 AD and contained several chests with the inscriptions: "Jesus, son of Joseph", "Joseph" and "Maria". In a controversial documentary from 2007, journalist Simcha Jacobovici and filmmaker James Cameron claimed that the tomb belonged to Jesus' family.

Most researchers reject the theory: names like Jesus, Joseph and Mary were common at the time and Jesus' family was too poor to build an expensive family tomb.



## Miracles were a part of everyday life in Palestine

Jesus was known to perform miracles and heal the sick – but maybe his patients weren't as sick as the Bible suggests.

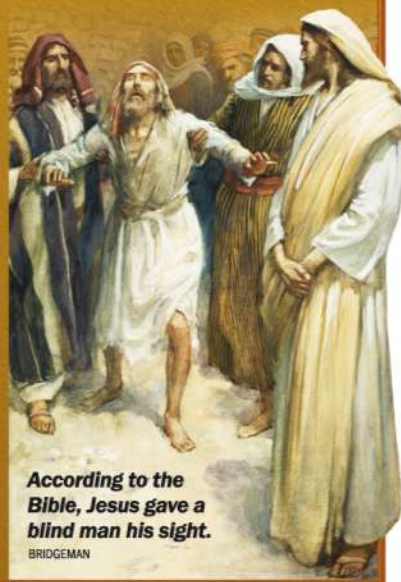
In addition to preaching, Jesus was reputed to heal the sick, cast out demons and even bring people back from the dead. In the Bible, the miracles produced evidence that he was specifically chosen by God. In fact, the belief that both disease and cure were the result of divine intervention was very common in Palestine during Jesus' time.

Miracle makers were not unusual in Palestine. Equipped with amulets and spells written on papyrus or scratched into clay, they went to the sick and needy. Even medical professionals, trained in methods developed by the skilled Greek physician Hippocrates, used spells.

Some historians have pointed out that several of the diseases that Jesus cured – speech difficulties, bleeding disorders and seizures – may have been psychological, conditional or temporary. The American religious historian E P Sanders states that in at least one case, Jesus suggested that a little girl, whom

he had apparently awakened from the dead, was just sleeping (Mark 5:39).

Researchers emphasise that modern scientists cannot judge something as unscientific as miracles. What they can establish, however, is that both Jesus and his followers believed in miracles and saw them as real.



According to the Bible, Jesus gave a blind man his sight.

BRIDGEMAN

population under control with an iron fist. The southern part of Palestine was managed by a Roman prefect – a type of governor. By allowing him to ally with powerful groups among the Jews – the rich and the clergy – the Romans maintained peace by giving the Jews a

*As anger and resentment brewed, there was more and more talk about Israel needing a new King David, someone to overthrow the Romans and make Jews free again.*

degree of influence. The northern part of Palestine – Jesus' region – was not directly subject to Roman influence, but was ruled by a

local leader who in reality served as a Roman puppet. This is how it was for Jesus' family, who were neither wealthy nor powerful. Taxation of Jews was fierce and without notice the Romans confiscated grains, animals and supplies. It was common for the Romans to steal personal belongings and rape Jewish women. Added to this were the religious abuses – like when Roman soldiers violated the Jewish prohibition of icons by wearing their decorated standards in the streets.

Just outside Palestine's borders, 25,000 legionaries were ready to quell any rebellion. No one was in any doubt that this was not the Jews' own home. For anyone who grew up in these depressed conditions, the word "Roman" triggered a sense of fear and humiliation. As anger and resentment brewed, there was more and more talk of Israel needing a new King David, someone who could overthrow the Romans to make Jews free again.

### God would help his people

No one knows what the young Jesus thought of the Romans, as historians have no credible source for his life before his mid-twenties. Palestine abounded with religious zealots preaching radical change. According to Jewish tradition, God would always help his people, as long as they believed, and because of this, the resistance against the Romans was closely linked to a religious revival. Hope for a new strong king was associated with scriptural prophecies of one that would "crush the serpent's head" and restore the Jews' freedom.

All around Palestine, lay preachers proclaimed the Messiah's imminent coming and God's salvation. With appealing messages, many were attracted to the often charismatic individuals who oversaw the religious groups. Jesus was also enchanted by one of these leaders and in his late 20s he joined a man called John the Baptist, a missionary in rural Palestine.

John the Baptist was Jesus' mentor and an inspirational extremist. He dressed strictly ascetically – in camel hair robes held together by a leather belt around his waist – and lived in the wild with "locusts and wild honey", according to the Gospels. The sermons saved for Jesus and his other followers revealed John as an uncompromising preacher. He preached that the Kingdom of God was near and rejected unworthy followers, chanting that they were "O generation of vipers" that could come back once they had repented of their sins. He set strict requirements of solidarity between his





Herod's tomb lies at the royal fortress of Herodium just outside Jerusalem.

## Herod's mausoleum

"The body was carried 200 furlongs, to Herodium, where he had given order to be buried", was how the historian Josephus described King Herod's funeral who, according to the Bible committed infanticide, shortly after Jesus was born.

Archaeologists found the tomb in 2007, a few kilometres from Jerusalem. Inside the mausoleum was a richly decorated sarcophagus, which had been destroyed – probably during a Jewish revolt – and contained no remains.

followers with the words: "Anyone who has two shirts should share with the one who has none, and anyone who has food should do the same" (Luke 3:11). John asserted that they would fall from grace if they strayed from the right path. "Prepare yourselves for the wrath", he thundered, "for a tree that does not bear good fruit will be cut down and thrown into the fire".

### Jesus' career only lasted a year

According to the Gospels, Jesus was baptised by John. A Jew would always wash before visiting the temple, but baptism as the transition to a new, godlier life, was invented by John, where he would dip his followers in the River Jordan and bless them.

Soon after his baptism, Jesus began to preach around Galilee. He went from town to town and talked at the local synagogue where people met, ate and discussed daily issues.

Although historians do not know what Jesus looked like or how he sounded, they know his native tongue was Aramaic and that his strong charisma and talking skills soon earned him a small flock of disciples who followed him around the country. As soon as they saw Jesus the disciples left their former lives, family and businesses to follow him. Historians believe that Jesus had already acquired a certain reputation, since he was known in Galilee where the fishermen Simon and Andrew left their nets to become "fishers of men" alongside Jesus as his first disciples.

No one knows exactly how long Jesus preached for but it's thought to have been

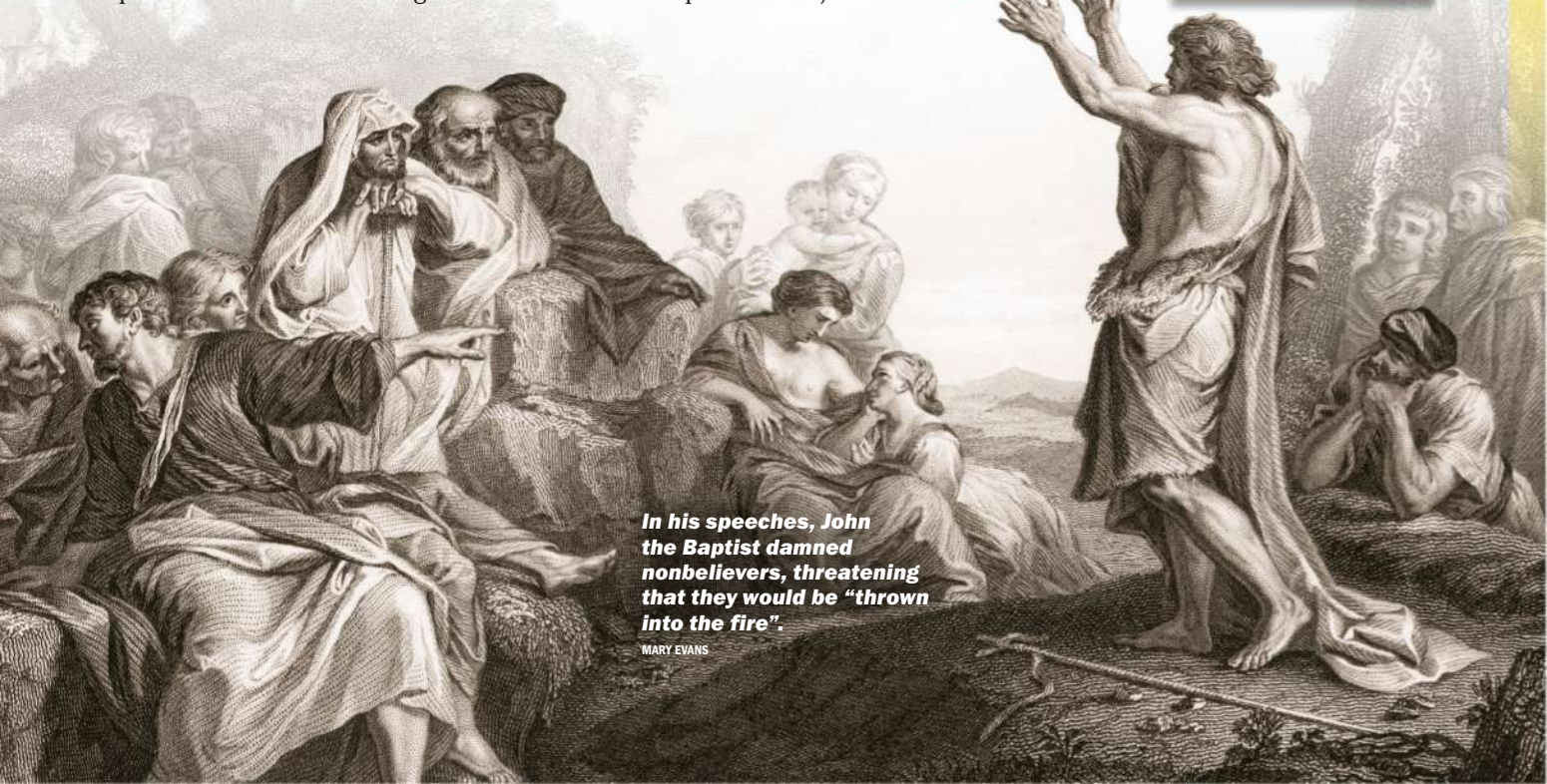
about a year. All signs indicate that his group was not well organised and from day one, Jesus and his disciples slept where they could find shelter and ate with anyone who offered them food. Historians also believe that neither he nor his disciples, men of humble means, would have been able to survive much longer without income. They suggest that if Jesus had been on the road for more than a year, he would have needed to have been better organised.

### Criticism of the Romans was mild

Shortly after Jesus' baptism, John was arrested and executed. According to the Gospels, John had accused the local tetrarch (sub-king) of immorality. It's more likely – as the historian Josephus points out – that John was killed because he was an influential speaker with strong opinions and as such, became a threat to the Roman Empire. They knew that religion could be politically explosive, and John's promise of a kingdom could easily be interpreted as a call to rebellion.

Nothing suggests that at this point Jesus had done anything to make the Romans nervous, even though his message was much the same as John's: "The Kingdom of God was near and the time had come to repent and follow his commandments". Jesus added a strong social message: "In the Kingdom of God equality prevails, and the same principle should apply on earth. People serve God best by helping the weakest in society".

In some areas, Jesus went up against the existing order. According to the Gospel of Mark, when his ►



In his speeches, John the Baptist damned nonbelievers, threatening that they would be "thrown into the fire".

MARY EVANS





**During the year that Jesus was on the roads of Galilee, his entourage of followers simply grew and grew.**

BRIDGEMAN

family tried to pull him away from the religious revival because they thought he was “beside himself” and suffering from a form of mental illness, he retaliated. He refused to let them in, calling his disciples his true family. This didn’t go down well in a society where the expectation was that family should be both honoured and respected.

In other respects, Jesus was more relaxed than most. He loved good food and a glass of wine – so much so that his opponents branded him immoral. “For John the Baptist has come eating no bread and drinking no wine, and you

*Jesus was more relaxed than most. He loved good food and a glass of wine – so much so that his opponents branded him immoral.*

say, ‘He has a demon.’ The Son of Man has come eating and drinking, and you say, ‘Look at him! A glutton and a drunkard, a friend of tax collectors and sinners!’” says Jesus,

obviously tired of being compared to the ascetic John (Matt. 11: 18-19). With regards to politics, Jesus seemed almost harmless, even though he sometimes criticised and made fun of the Romans. Jesus’ preaching was filled with references to the difference between the earthly and the heavenly kingdom. This was synonymous to a Jew’s situation of living within the Roman Empire where earthly things seemed evil, unjust and superficial, while the Kingdom of God was the exact opposite.

An example of his indirect criticism can be found in the Gospel of Mark where Jesus casts out demons from a man. According to the account, Jesus leads the spirits into a herd of pigs, which then plunge over a cliff. When Jesus asks the spirits for their name, they reply: “My name is Legion, for we are many”. According to Biblical scholar John Dominic Crossan, the report can be read as an anti-Roman parable as “Legion” of that time was a reference to the Roman legions. The story ends with the pigs – an unclean animal – drowning in the sea, putting across a strong opinion about the occupying power, cleverly wrapped in a positive story of miraculous healing.

Likewise, when asked a question about whether Jews should pay Roman taxes, Jesus replies, “Render unto Caesar what is Caesar’s and unto God what is God’s”. It’s an answer that is at best ambiguous, for what might belong to the Emperor? And who is God?

### **Pharisees were the Christians’ competition**

Jesus did not criticise Rome directly and there is nothing to indicate that his talk of a kingdom was a call for rebellion. Although he called for political and social change, historians assess that Jesus expected any upheaval to come from God and not from mere mortals. Moreover, Jesus always accommodated the Roman Empire’s representatives and stressed that one should love everyone – even his enemies. Jesus ate with tax collectors, the Roman Empire’s most hated representatives, and willingly helped when a Roman soldier asked for help for his sick servant (Matt. 8: 5-10).

Jesus flatly rejected political ambition, saying: “the Son of man came not to be ministered unto, but to minister”. Jews had hoped for (and the Romans feared) a Messiah with a flaming sword in hand – Jesus put both groups’ expectations to shame.

Historians believe that Jesus considered himself to be an orthodox Jew. He stood by the Ten Commandments, which according to





At an antiques' dealers, police found equipment for engraving the coffin.

## James' fake coffin

In 2002, the press were told that an Israeli antiques' dealer had found a coffin with the inscription "James, son of Joseph, brother of Jesus".

Had the coffin been genuine, it would be one of the few relics from the 1st century with a Gospel connection. It turned out to be a forgery; the coffin was genuine but the inscription and the outside layer had been added by the dealer.

Jewish faith were transferred from God to the people, and observed the commandment to cleanse themselves before Passover celebrations, offerings and the like. Religious historian E P Sanders says that the Bible's many accounts of Jews who condemned Jesus because they considered he took the rules too lightly, are not true.

Many of the criticisms were from Jewish scribes who judged Jesus for not complying with scriptural commandments. One of the Gospels claims that the Pharisees – a group of Jewish evangelists – wanted to kill Jesus because he healed a man with a withered hand on the Sabbath, the Jewish holy day. Historians point out that the laws only prohibit Jews from working on the Sabbath and Jesus' healing only happened because the man reached out for help, so it could hardly be considered work.

E P Sanders believes that evangelists have distorted the stories. Jesus probably had lively discussions with other Jews, but disagreement remained within the framework that most orthodox Jews would accept. According to religious researcher Catherine D Murphy, the Pharisees were more tolerant than the evangelists known as "scribes" and could hardly be conferred without influence.

He also believes that the evangelists attempted to turn the Jews against Jesus to prevent him from spreading his true teachings,

because the Jews from the period in which the Gospels were written were the Christians' toughest theological competitors.

## Jesus was received as saviour

Over the year that Jesus walked and preached, his entourage steadily grew. Among the countless preachers who promised God's salvation and deliverance from bondage, Jesus had quickly established himself as a charismatic energy. His message of God's boundless love and forgiveness appealed to almost everyone, and Jesus' eloquence meant that many preferred to listen to his empathetic descriptions of the Kingdom of God rather than the traditional scholars' more abstract interpretations of the Holy Scriptures. Jesus' words gave hope to the many who dreamed of a saviour who could deliver them from Roman oppression and thousands showed up when he made his fiery speeches.

Although several of John the Baptist's disciples also began to preach, none of them achieved a popularity that remotely measured up to that of Jesus.

When Jesus showed up for the Passover celebration in Jerusalem, the situation was tense. Many of the pilgrims in the city knew of him, and the Romans grew nervous. According to the Gospels, the Romans had good reason to fear, for Jesus was met by a "very large crowd who spread their cloaks on the road. Others ▶

## Jesus was popular among rich women

**A significant number of Jesus' followers were wealthy women who provided lodging and paid for his travels.**

Right from the start as a preacher, Jesus attracted many women – especially from the higher social strata. Dr Luke mentions "Mary called Magdalene... and Joanna the wife of Herod's bailiff... and Susanna, and many others who put in what they had".

Historians suggest that many of the women who followed Jesus were wealthy and had the opportunity to help finance his preaching; they probably paid his disciples too, providing them with

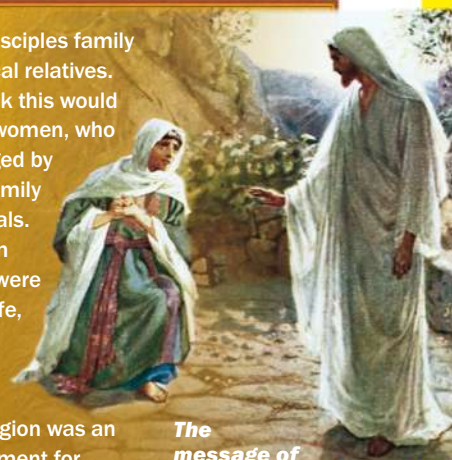
expenses and arranging food and lodging for them all.

According to the American religious historian Bart D Ehrman, Jesus attracted so many women because of his message of justice. Jesus' teaching – that the weak shall inherit the Kingdom of God – appealed to women who only had very limited opportunity to express themselves independently in the 1st century. Several historians also point out that Jesus was critical of the traditional family structure – including the

fact he called his disciples family and not his biological relatives.

Researchers think this would appeal strongly to women, who were generally judged by their place in the family and not as individuals.

That women from the higher classes were active in religious life, was not specific to Jesus' followers. In the 1st century, commitment to religion was an acceptable employment for wealthy women, and several other movements at the time of Jesus also had female benefactors. For example, the discovery of a plate with the names of contributors to a synagogue in Asia Minor reveal a large number of female donors.



The message of justice seemed attractive to rich women who sponsored Jesus.

BRIDGEMAN



# Evangelists targeted their propaganda

Historians' best source of Jesus' life are from the Gospels of the New Testament. However, they are filled with embellishment.

Researchers' sources for Jesus' history are scarce and even reliable sources are filled with pitfalls. Only a few contemporary historians – Josephus (about AD 37-100) and Tacitus (about AD 56-120) – mention Jesus directly and with the confidence of their own research. Historians derive the rest of their knowledge from the four Gospels of the New Testament. Although the scriptures' purpose is to convert nonbelievers, in the Gospels the life of Jesus is described in detail, and evangelists can tell a great deal about his time on earth, his dreams and tribulations. The

Gospels were written from approximately 70 to 100 years AD, when some of the first Christians wrote down the many stories of Jesus. Although the Gospels are named after some of Jesus' closest companions, it is doubtful that they wrote the words.

The Gospel of Mark was written first and therefore historians regarded it as the most credible gospel. Although Mark is biased, in defence, it's the closest thing historians have to a sober record of Jesus' life, because it is free from the embellishments of the other evangelists. For example, Mark says bluntly that Jesus was

merely one of many who followed John the Baptist. Other evangelists describe a special relationship between Jesus and John.

The Gospels of St. Luke and Matthew came later and the stories were largely copied from the Gospel of Mark.

Simultaneously, some of the tales were rewritten so that they fitted better with the image of Jesus as God's right-hand man.



**Josephus was one of few who described Jesus. Other information came from historical sources.**

MARY EVANS

## Calendar error: Jesus was four years older.

In the year 527, the monk, Dionysius Exegus figured out that Jesus was born 754 years after the founding of Rome. He based his calculation on stories in Gospel of Luke about Jesus and John the Baptist. Dionysius took account that both Luke and Matthew placed Jesus' birth during Herod's reign, which ended in the year 4 BC.

So, in all probability, Jesus may have been born four years before our era – and his own official birth.



According to the Bible, Pilate wanted Jesus released, but the Jews wanted him dead.

cut branches from the trees and spread them on the road. And the multitudes... shouted 'Hosanna to the Son of David!' the evangelist Matthew shared.

Historians are unsure whether Jesus travelled to Jerusalem because he wanted to celebrate like other orthodox Jews, or whether he expected God to let his kingdom come under this symbolic celebration. Based on the Gospels' teachings, historians are leaning towards the second theory. In any case, the combination of a large crowd and the name of

King David made the Romans nervous. Jesus was aware that the Romans would not tolerate his free movement much longer and gathered his disciples for a last meal. Then he went with his most trusted disciples up to a peaceful grove on the Mount of Olives to find inner peace and reconcile his fate. While he wandered desperately around the mountain, it happened just as Jesus had predicted: a bunch of grim-looking men surrounded him.

## Pilate executed without blinking

According to Matthew, a "great multitude with swords and clubs, sent from the chief priests and elders of the people" came and led Jesus away. One of Jesus' own disciples, Judas Iscariot, told them who to look for. Historians believe that the story of Judas may be true, as the evangelists were not interested in inventing such an embarrassing story about treachery in their own ranks.

Judas' motives are difficult to assess. According to some theories Judas was disappointed with Jesus' direct dealings with the Romans and wanted to provoke a confrontation. Others believe that Judas gave up his mentor for greed – the Gospels say that he was paid 30 pieces of silver. The Gospels also tell that the Roman prefect Pontius Pilate





This limestone is the only archaeological reference to Pontius Pilate.

## Pilate's monument

In 1961, during excavations of a theatre from King Herod's time in the city of Caesarea Maritima, archaeologists found an 82 x 65-centimetre stone plaque.

The inscription on the stone read: "The prefect of Judea, Pontius Pilate, built this Tiberium (temple in Emperor Tiberius' honour.) to the gods".

Caesarea Maritima, located on the Mediterranean coast between Tel Aviv and Haifa, was the seat of government in Judea during Pilate's time, and researchers are convinced that the legend is true.

The limestone dedication is the only archaeological proof of Pontius Pilate.

lobbied for Jesus to be spared, but the Jewish elite wanted him executed. They were inflamed and angry that Jesus had exposed their hypocrisy and accused them of blasphemy. No matter how much Pilate tried to spare him, a crowd of ordinary Jews and their elite leaders would not let Jesus escape. Frustrated, Pilate washed his hands as a sign that he denounced Jesus' condemnation.

This report does not fit with historians' knowledge of power in Roman-occupied Palestine. The Romans wanted to be on good terms with the Jewish elite, but the power was ultimately theirs. The Jews' part in Jesus' death is minimal and mostly an expression of the local elite trying to adapt to the reality of Palestine in about 30 AD – a Jewish revolt would be too much, so in an attempt to deflect the Romans' anger, they agreed to Jesus' arrest.

This version is also confirmed in John's gospel. Shortly before Jesus went to Jerusalem, a high priest met with leading Jews and discussed the danger posed by Jesus and his growing band of followers. "It is better for you that one man should perish than that the whole nation perish", he noted. Then they decided to stand up to the Romans for not putting peace and their privileged positions at stake. So, it is probably true that a group of Jews seized Jesus.

The image of Pontius Pilate as a kind-hearted yet indecisive official is also inconsistent with other sources. Pilate was known as a ruthless prefect, who executed people without trial. For example, a few years after Jesus' death he murdered a gathering of pilgrims in Palestine – an act that caused him to be fired as a prefect.

The Gospels paint a gentle picture of Pilate – and the Roman's role in Jesus' death – because, according to historians, in the 1st century the

Christians needed to be on good terms with the Romans, while the Jewish role as a power in Palestine was largely overplayed.

### Jesus died in despair

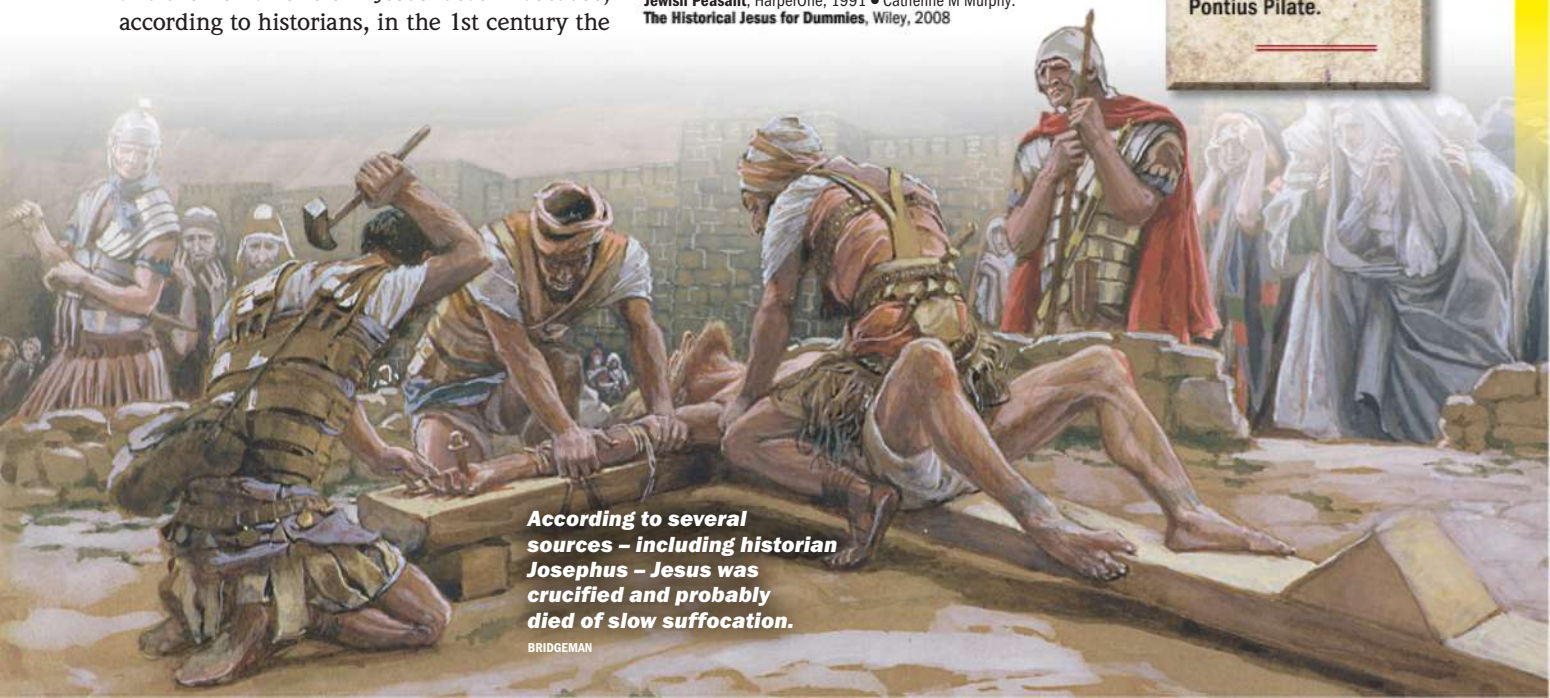
"He was the Christ, and when Pilate... had condemned him to the cross, those that loved him at the first did not forsake him", Josephus wrote about Jesus' execution. Historians do not know the details of the crucifixion, but the standard procedure was that the offender had his hands and feet nailed to the cross, so he hung from the shoulders. The wooden cross bar puts great pressure on the ribs and diaphragm, so after a while the offender is strangled: this kind of death was considered humiliating and was usually reserved for outcasts like slaves, rebels and common thieves. Historians believe that Jesus was probably convicted after saying something that might harm Rome's reputation.

The agony could last several days, but Jesus escaped graciously. He died after only a few hours, while – according to the Gospels – he exclaimed: "My God, my God, why have you forsaken me?" Some historians believe that the sentence was added later. Others see it as proof that Jesus did not expect to die on the cross.

Whether Jesus' fate was predetermined, or he was simply in the wrong place at the wrong time, the crucifixion changed history. The Roman Empire had crushed Jesus. In return, they paved the way for a religious movement stronger than they could have imagined. ■

### FURTHER READING

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- John Dominic Crossan: *The Historical Jesus: The Life of a Mediterranean Jewish Peasant*, HarperOne, 1991
- Catherine M Murphy: *The Historical Jesus for Dummies*, Wiley, 2008



According to several sources – including historian Josephus – Jesus was crucified and probably died of slow suffocation.

BRIDGEMAN



**W**hen Adolf Hitler came out from the building as Germany's new chancellor, the winter sun shone over the Reich Chancellery. Just a few years before, he had been considered an upstart – someone the political elite looked at with contempt: “the Bohemian corporal” as President Hindenburg called him. Following the election of 30th January 1933, the roles were reversed and Hindenburg had to accept him as country's new leader.

Wearing a top hat and frock coat in the bright winter light, Hitler was ready to take his role as a statesman.

A crowd of his most faithful followers waited to commemorate the event at the Hotel Kaiserhof, opposite the Reich Chancellery. Hitler beamed with joy and pride, and when he met the crowd in the hall he had tears in his eyes, an eyewitness reported later.

The tribute continued into the evening when 25,000 members of the Sturmabteilung (SA) party militia sang as they marched through the Brandenburg Gate up to the Reich Chancellery. The flames from their torches shone in their highly polished boots and German flags could be glimpsed in their flickering glow. In front of the Reich Chancellery, the crowd were exuberant as they united in cheers of: “Sieg Heil!”

As the cries grew in strength, Hitler appeared at one of the lighted windows and raised his arm in greeting.

Throughout the country from Flensburg in the north to Munich in the south, inhabitants eagerly turned on their radio to follow the events broadcast live from Berlin. Hitler's appointment as chancellor could be followed across the whole of Germany that evening, as Nazi propaganda master Joseph Goebbels had forced it on to state radio.

Everyone should know that something new was happening. Hitler would do away with the old regime, which in his opinion was based on

“stupidity, mediocrity, half-hearted positions, cowardice, weakness and inadequacy”, and Germany would be lifted out of poverty and humiliation following its defeat in WWI. Goebbels was pleased when after midnight, he left the Reich Chancellery “in a senseless intoxication of enthusiasm”.

Hitler was relieved that the big day had finally come. He had confided that he had been saved by divine intervention, “when I was about to suffer a shipwreck, choking in intrigue and economic difficulties”.

After 14 years of political aspirations – with the last four years as one long gruelling election campaign – Hitler had finally come to power. All the struggles he had experienced finally seemed worth it.

### **A gifted but lazy boy**

Hitler was born 20th April, 1889 in Braunau am Inn in northern Austria. His father, Alois Hitler, was a straight and very particular customs official.

His mother Klara was more concerned with Adolf's care than his upbringing and they had a very close relationship. Yet Adolf and his father were often at loggerheads, as Alois' ambition for his son fell completely outside of what the dreamer Adolf had in mind. The boy didn't miss a single opportunity to tell his father that he would never be locked in a customs office and would enjoy the free life as an artist.

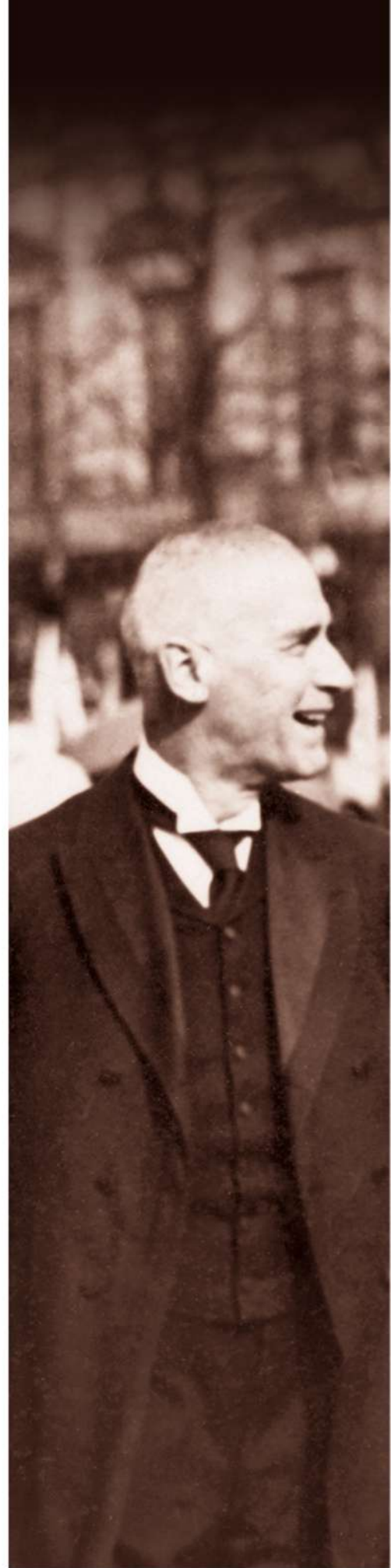
When the boy was five, the family moved to Linz, where he spent his school years. Adolf was gifted but lazy.

He found it hard to make friends and tried anything to avoid going to school. At 16, his mother allowed him to leave school before graduating. His father had died two years earlier and could no longer exercise any control over what he did.

### **The artist's dreams are crushed**

Instead of going to school Adolf spent his time daydreaming, drawing, painting and going to the opera. In particular, he enjoyed Richard Wagner's tragedies. When he was 18 years ▶

*With his life's dream  
in ruins, Hitler drifted  
randomly without  
finding any meaning  
to his life.*



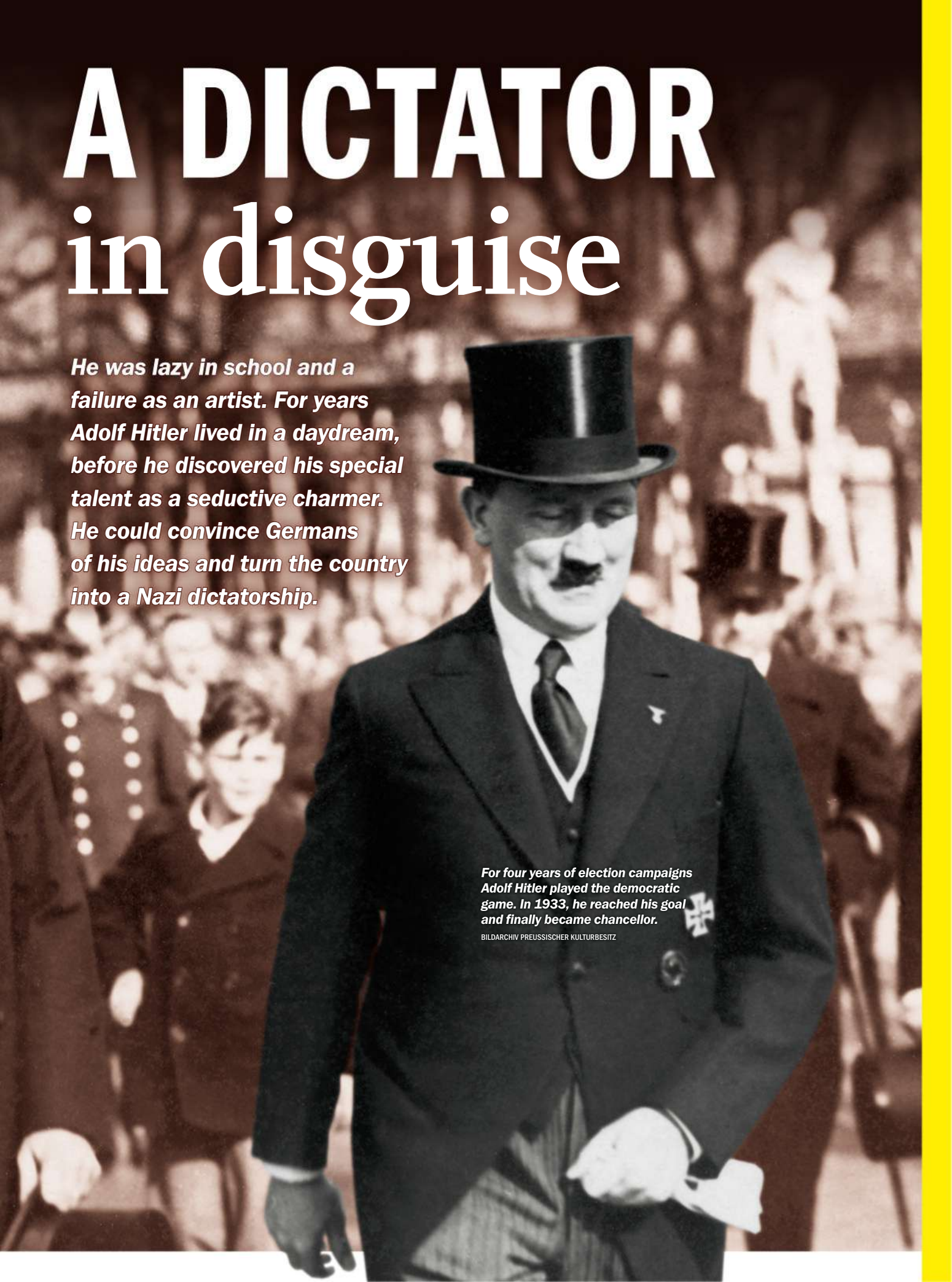


# A DICTATOR in disguise

*He was lazy in school and a failure as an artist. For years Adolf Hitler lived in a daydream, before he discovered his special talent as a seductive charmer. He could convince Germans of his ideas and turn the country into a Nazi dictatorship.*

*For four years of election campaigns Adolf Hitler played the democratic game. In 1933, he reached his goal and finally became chancellor.*

BILDARCHIV PREUSSISCHER KULTURBESITZ







*As a boy, Adolf Hitler was a dreamer with unrealistic plans to become an artist.*



*During WWI, Hitler finally found a purpose in life. He felt at ease among soldiers and colleagues and showed great bravery in battle. He received two Iron Crosses.*

old, Hitler went to Vienna to follow his artistic dreams. In the early 1900s, the city was a magnificent metropolis. Its streets were filled with people from the vast Austro-Hungarian Empire: Austrians, Hungarians, Poles and other people from the kingdom's Slavic areas. Art, culture and architecture flourished. The young Hitler was thrilled with big city life. He spent hours admiring the buildings and often went to the opera.

Then, everything changed. After failing the entrance examination to the Academy of Arts twice, Hitler was told that he would never become a painter, but that he might become an architect. As he had not completed his secondary education he was not able to pursue the opportunity. And without it, he couldn't follow his dream. So lacking any direction or meaning, he drifted.

During this time, he discovered the "other Vienna", with its tensions, simmering discontent and a feeling that the old empire would be overthrown. After his mother's death he was well provided for, yet Hitler was frustrated. He felt unappreciated. His personal feelings were fuelled by what he saw and heard from lowlifes in the shelters and on the estates where he lived.

### **Hitler's hatred of Jews is awoken**

Like many others who search for a reason for their personal failure, Hitler honed in on the Jews as the culprits. The anti-Semitic pamphlets, which were published in large numbers in Vienna, agreed with him: the Jews had joined forces to destroy Austria. Propaganda

destroyed the workers' love for their country, luring them into International Marxism. Hitler was obsessed by Jews, "for only in the brain of a monster – not that of a man – could the plan of an organisation assume form and meaning, whose activity must ultimately result in the collapse of human culture and the world's destruction", he later wrote.

Vienna's mayor Karl Lueger combined social welfare with nationalism and anti-

*As Germany  
surrendered, Hitler  
threw himself on his  
bed, buried his head in  
the pillow and wept.*

Semitism – a cocktail reminiscent of Hitler's later brand of national socialism. Lueger was a powerful speaker and could touch the "man in the street" with his simple messages.

Hitler was politically awakened and inspired by Lueger's eloquent speeches. But social democracy was his true inspiration. He admired their use of propaganda to mobilise the masses.

### **WWI breaks out**

Sick and tired of Vienna and the city's cosmopolitan disorder, Hitler travelled to Munich in Germany, where he continued his reverie while trying to make a living from his painting. On 1st August, 1914 Germany declared

war on Russia and soon after, WWI was a reality. Hitler enthusiastically volunteered for military service and joined the 16th Bavarian reserve infantry regiment. After almost ten weeks of training, the regiment was sent to the Western Front and thrown into one of the war's first bloody battles – the Battle of Ypres in October 1914. Eyewitnesses told how young untrained Germans full of confidence and arm-in-arm, went up against the British, singing patriotic songs. By contrast, the British were well prepared and the Germans suffered heavy casualties. Yet, Hitler described the war as "unforgettable and the greatest time of my life". He felt at home with soldiers and in a fight where he could excel for a great cause.

Hitler was on the Front for four years. Twice he was awarded the Iron Cross in 1918, which was unusual for a lance corporal. He was well-liked among his colleagues, but was also a bit of a loner. He could disappear in thought and then plunge into long monologues about military strategy – which his peers sometimes found inappropriate.

During one of the last British gas attacks, Hitler was blinded and had to be treated at a hospital. It was here that he was told that Germany had surrendered. The announcement came as a shock, and Hitler – by his own admission – threw himself on his bed, buried his head in the pillow and wept.

### **Hitler discovers his special talent**

After the war, Hitler sought refuge with his regiment in the barracks in Munich,



where he tried to come to terms with the new circumstances. The German emperor had abdicated and Germany became a republic. But democracy was weak from the beginning and found itself threatened by armed troops and frequent revolts.

Hitler felt a strong hatred of the "November criminals", politicians who had undermined Germany's fighting strength and forced the country to surrender. His thoughts revolved around revenge and restoration of Germany's honour.

Unexpectedly, his directionless ideas fell into place in September 1919, when he was working as an intelligence officer, assigned to keep an eye on the small "Nationalistische Deutsche Arbeiterpartei". Hitler quickly changed from his role of observer, eagerly throwing himself into the political discussion. A month later, he had joined the party and became responsible for its recruitment and propaganda.

Party work gave Hitler back his confidence and he discovered his skills as a speaker. His explanation of the Jews' and Communists' betrayal of the German people resonated with many.

People cheered when Hitler gave in to a passionate rage over the Treaty of Versailles and Germany's downfall. Party membership steadily grew and Hitler's breakthrough came in 1920, when over 2,000 attended a public party meeting. Shortly after, the party changed its name to "Nationalsozialistische Deutsche Arbeiterpartei" (NSDAP), adopting the swastika as its symbol.

### The Nazis' "Beer Hall Putsch"

In 1921 Hitler, who was now the party's leader, was in the process of ensuring NSDAP members received standard badges, armbands and flags. He also established the SA Corps, who marched in the streets to attract sympathisers and scare Nazi opposition.

Conflict continued as France and England foreclosed on the town of

Ruhr when the Germans defaulted on war reparation payments, a galloping inflation weakened the Republic and in several places local rebellion erupted.

Hitler particularly liked how, in 1922, Benito Mussolini had come to power in Italy, by leading his partisans on the infamous "Blackshirts" march on Rome. The current regime in Germany was

hardly more viable than the government "Il Duce" had overturned, so Hitler planned to seize power in a similar manner by marching on Berlin.

The first step was a coup in the Bavarian capital, Munich. In the evening of 8th November, 1923, Hitler stormed into the beer hall Bürgerbräukeller, fired his pistol in the air and declared that ►

## Mussolini was his role model

**Hitler admired Mussolini. He copied his speeches, his party uniforms and his coup attempt, yet "Il Duce" gave him the cold shoulder.**

Initially, the Italian fascist leader Benito Mussolini had nothing but contempt for "barbarian" Adolf Hitler, and for more than 10 years refused to meet him.

His dismissive attitude nagged at Hitler, who admired Italian culture and ancient Rome's buildings. He felt a deep, Aryan kinship with Mussolini and copied several of his ideas. Nazi stormtroopers (SA) dressed in brown shirts were inspired by the fascist "Blackshirts", the Beer Hall Putsch in 1923 was copied from Mussolini's seizure of power in Rome and his own

theatrical appearance at a lectern was taken from "Il Duce".

When Hitler seized power in 1933, Mussolini was amazed and the following year agreed to meet the German upstart. Yet, it was only in 1935 – when Italy invaded Abyssinia (Ethiopia) and faced international disapproval – that the "Pact of Steel" was formed between the two countries.

Although Hitler was soon disappointed by the Italians' lack of fighting spirit, he continued to support his role model, Mussolini.

**Hitler watched Mussolini speak on camera so that he could study the effect.**

POLIFOTO/TOPEFOTO & BILDARCHIV  
PREUSSISCHER KULTURBESITZ







Hitler's plans for a coup were known to the Bavarian authorities who sent police against the Nazis. In Munich, four officers and 14 Nazis were killed. The 14 later became Nazi martyrs.



"I am married to the German people", Hitler said. Eva Braun's relationship was a secret.

## Hitler promised "peace in our time"

Britain and France wanted to avoid another war with Germany, at all costs. WWI had demanded huge sacrifice, and until 1939, Prime Minister Neville Chamberlain stuck by his appeasement policy. He let the Germans take the Czechoslovakian province of Sudetenland and in exchange Hitler promised to curb further expansion. Hitler signed the agreement for "peace in our time", but the document Chamberlain waved on his return to London was worth nothing. The following year, Hitler took the rest of Czechoslovakia and attacked Poland.



Prime Minister Neville Chamberlain accepted Hitler's false peace pledge.

the national revolution had begun. He had not gained sufficient support from the political side, and during the night the Bavarian authorities secured the city against a Nazi takeover. Hitler expected an easy victory and the following day marched his men through the town. The marchers were greeted by the Bavarian police, who opened fire killing 14 Nazis.

### Nazis chose democracy

It was obviously not yet time for a Nazi revolution. Hitler had made a mistake. Instead, he was charged with treason. Hitler pleaded not guilty. He argued that his actions had been empowered by the existence of traitors – he'd simply acted in the national interest. Hitler found a receptive audience – even the judges accepted his motives and praised his nationalism. He was sentenced to five years in prison, but after about a year he was released for good behaviour.

Hitler had to admit that he needed to work within the law if he wanted to seize power. He began to rebuild the Nazi Party, which had almost disintegrated during his absence. The trial made him a household name and he acquired many new supporters, so was still able to pull in full houses for his inflammatory speeches. Every so often he crossed the line – an observer said that Hitler's speeches were like violent assaults – and he was banned from making speeches in large parts of Germany. But he still spoke to private

audiences and used the years from 1925 to 1928 to set up groups all over the country, establish the party on a national basis and introduce influential people like Goebbels.

As a legal party, the Nazis requested representation at the elections in the spring of 1929. It did not go smoothly for them until after November, when the stock market crashed on Wall Street. As a result of this, the German economy collapsed, and by 1932 there were over six million unemployed, around 33 per cent of the workforce.

The progress that the Germans had experienced throughout the 1920s went into reverse, and confidence in politicians waned as they failed to cope with the situation. The Nazis seized the opportunity with a well-oiled propaganda machine. They launched an attack on Germany's faltering democracy. Hitler became the party's most effective weapon as he took on the task of Germany's saviour and the people accepted this gratefully.

### Germany leads

When, between April and November 1932, he took part in 148 rallies with his "Deutschlandflug" (German flight), the image of Hitler as Messiah was complete. The meetings, which often drew an audience of 20,000-30,000, were reminiscent of religious revival meetings, when the Führer came down from the sky to speak to the people. This was reinforced on the night in



1933, when Hitler became Chancellor of the Reich in a euphoric celebration, “Führer, prophet... the masses last hope, a symbol of German commitment to freedom”, as Goebbels put it.

Hitler was now the leader of a coalition government, which in no way satisfied his ambitions. He did not intend to rule at the mercy of others, and instead wrote out another election manifesto. The mood of the population could be used to secure his position as the country’s new leader, and in the elections on 5th March, 1933, 51.9 per cent of voters chose a new, Hitler-led government of Nazis and their allies.

For the Germans, it was the last chance to go to the polls: immediately after the election, Hitler started to break down democracy. On 23rd March, the Nazis adopted a so-called Enabling Act. This law made it possible for Hitler to rule without parliament or a president – now he was sole ruler of Germany.

#### Hitler forms the Nazi state

By all means possible, Hitler sought to create the people and the community that he had fantasised about during his travels in Vienna, and which he had glimpsed on the muddy fields of Ypres. “We all have unbounded confidence, for we believe in our nation and in its

eternal values. Farmers, workers, and the middle class must unite to contribute the bricks wherewith to build the new Reich”, he enthused. Nazification was all-consuming – all parties other than the NSDAP were banned or dissolved, all police and courts came under Nazi control, trade unions and employers’ organizations were merged into one Nazi labour organization.

***“Farmers, workers  
and the middle class  
must unite...”  
Hitler enthused.***

During 1933, 50,000 communists and socialists were imprisoned or placed in the newly created concentration camps. Under the Nuremberg Laws of 1935, Jews were deprived of their civil rights, and three years later, the Nazis staged “Kristallnacht”, murdering thousands of Jews.

#### Hitler becomes “just a soldier”

In the mid-1930s, Hitler confronted the Treaty of Versailles again, this time to reinstate Germany’s honour. He planned to gather all ethnic Germans across Europe together to create a

“Lebensraum” (living space) for the growing population. But he also wanted war for war’s sake.

Keeping in mind his own experiences, he said that “war is the best education of the German youth”. In 1936, the country was heavily rearmed; with nearly half of all public expenditure put to military purposes.

Austria was first on the list of potential acquisitions, and for Hitler it was a great personal victory when in 1938, the country’s citizens voted for the so-called “Anschluss” and became a part of Germany. The following year, he took Czechoslovakia without any meaningful international opposition.

On 1st September 1939, German troops rolled into Poland. Based on earlier ultimatums, England and France declared war. Hitler gleefully took on the role as a commander: “I am... just a soldier of the German Reich”, he declared. “I have once more put on that coat that was the most sacred and dear to me. I will not take it off again until victory is secured”.

#### FURTHER READING

● Karl Christian Lammers: *Forerun – Hitlers politiske karriere*, Schönberg, 1991 ● Joachim C. Fest: *Hitler*, Samleren, 1973 ● Alan Bullock: *Hitler*, Fremads Forlag, 1966 ● Sebastian Haffner: *The Meaning of Hitler*, Harvard University Press, 2004

## His victorious period was over

France’s surrender in 1940 was Hitler’s last great triumph. The invasion of the Soviet Union in 1941 was the start of Hitler’s downfall in Europe.

**W**hen Nazi Germany went into Poland in 1939, WWII was inevitable, and Hitler gladly took on the role of a soldier. He enjoyed war and took part eagerly as the army’s leader. Poland was defeated by Blitzkrieg and the year after he took France.

But Hitler’s belief in his own infallibility quickly led to fatal mistakes including the invasion of the Soviet Union. By the time it faced crushing defeat at Stalingrad in January 1943, Germany was retreating on all fronts.

As the bad news from the Front intensified, Nazis herded Europe’s Jews into concentration camps and exterminated them. There is no evidence that Hitler ordered the

genocide personally, but on 2nd April, 1945 he stated that “National Socialism will be forever grateful that I have exterminated the Jews from Germany and Central Europe”.

Less than a month later, Hitler took his own life in his bunker in Berlin. In his will, he described the six years of war as history’s “most honourable and courageous manifestation of a people’s will to live”. Shortly before his suicide, he married his mistress of 13 years, Eva Braun and appointed Grand Admiral Dönitz as the new German leader.

***In March 1945, Hitler made one last public appearance – worn out and ill.***

BILDARCHIV PREUSSISCHER KULTURBESITZ





A detailed mosaic of Alexander the Great on a horse, with a woman (his mother) visible in the background. The mosaic is made of small tiles in various colors, including gold, red, and brown. Alexander is shown in profile, looking to the right, with a serious expression. He is wearing a patterned tunic and a helmet. The horse is also depicted in profile, facing left. The woman in the background is looking towards the viewer.

Alexander got the lust for power  
at his mother's knee:

# Born to greatness

*Hatred, intrigue and murder. Alexander the Great's childhood was marked by relentless battles between his parents and by their burning ambitions on his behalf. At the age of only 25 he conquered one of history's greatest empires.*



## MACEDONIA / 334 BC

Pella, the capital of Macedonia, is rich and expanding, having already overthrown Greece, Bulgaria and large parts of Serbia. When Alexander begins his campaign, he has a professional army of around 35,000 men.



### His father was a great conqueror

**Philip II of Macedonia was a great military leader and created a strong professional army. He gave Alexander the best education, but the relationship between father and son was marked by suspicion and sometimes open hostility.**

THE ART ARCHIVE



### His mother was unforgiving

**Queen Olympias was a ruthlessly ambitious woman, who hated her unfaithful husband intensely. She was never tired of telling Alexander about his father's many errors and the need to outdo him at any cost.**

THE ART ARCHIVE

*The cavalry was the Macedonian army's offensive power, and Alexander rode at the front in every battle.*

BRIDGEMAN



The sun sets over the palace of Pella. In Macedonia's capital, a beautiful young queen sits in an ornate room, cradling her newborn son in her arms. She looks up at the sound of running. The door opens and a messenger delivers a letter to a maid who starts reading.

The same night as the queen gave birth to her son, the famous Artemis temple in Ephesus burned down. The priests believe it is a warning that the world has been set alight and that there that will be change in the East.

Queen Olympias smiles mysteriously. The event will mark her son Alexander's arrival into the world forever. And she'll make sure that he understands the magnificent fate the gods have bestowed on him.

### His mother instilled megalomania

This happened in 356 BC. At that time, only the gods knew that within the next 25 years the newborn baby boy would crush the world's most powerful army, and become ruler of one of history's greatest empires.

Alexander was the son of Philip II of Macedonia, an expanding state in northern Greece. His mother, Olympias was born a princess in the tiny neighbouring kingdom of Epirus, part of modern-day Albania. Philip, who already had several wives, married Olympias as part of his alliance policy. He never hid the fact that he considered his beautiful wife and all her people to be little more than simple barbarians.

His subsequent marriage only hardened Phillip's attitude. Olympias had grown the mysterious Orphic and Dionysian cults in his homeland, where during the nightly orgies she and her

cult members rushed around the forests with snakes in their hands. Olympias despised Philip in turn, as he took one lover after another. During his lifetime, the king and queen's hatred for each other influenced Alexander greatly.

Olympias instilled in her son, that through her bloodline he was descendant of the legendary hero Achilles – the greatest of Greek warriors, who according to Homer's Iliad fought at Troy. Alexander was so affected by the story that, according to contemporary sources, he always slept with a copy of the Iliad under his pillow. His favourite section of the story was a phrase that was allegedly uttered by Achilles during the siege of Troy: "Always be the best, my boy, the bravest..."

As a child, Alexander was not close to his father, an impressive commander who expanded his small kingdom to include northern Greece, today's Bulgaria and large parts of Serbia. From Philip's conquests he acquired the area's largest gold mines. With the riches from the mines, Phillip created a professional army, which he developed into a formidable war machine.

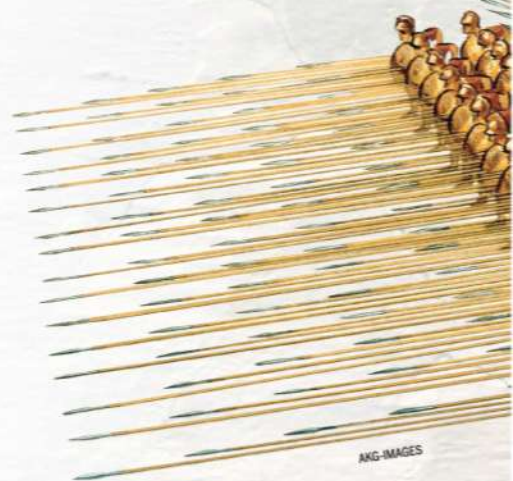
The core of the army was its infantry: a deep line of foot soldiers armed with spears of up to 4.5 metres long, who formed an almost impenetrable barrier. Each side of the infantry was flanked by cavalry, which was the army's offensive force. Alexander would later prove to be a virtuoso with the well-disciplined army that Philip had created.

While Philip was busy making conquests, Olympias filled her little son's head with stories of Philip's shortcomings. For Alexander, Philip was not a father, but a rival that should be crushed at all costs.

Only when Olympias had completely undermined the relationship between father and son, did it begin to dawn on Philip how dangerous the Queen's influence was. He sent Alexander away from Pella to be schooled in a small village in western Macedonia. Philip wanted the best education that money could buy for his son,

# Alexander's

**The young Alexander crushed the Greeks, Persians and Indians. Despite many battles over 16 years, he didn't lose a single fight. He was a tactical genius, and at the time, the Macedonian army was probably the world's best.**



and hired Aristotle, one of the greatest philosophers and scientists of all time, as his private teacher.

### Alexander was a military talent

It soon became clear that Alexander was both precocious and smart, blessed with an amazing understanding of people and situations. Alexander was trained in the art of war, a field in which he demonstrated exceptional skill.

The combination of Aristotle's philosophical teaching with a military education created one of history's most dangerous men: an idealist armed with a ruthlessness that came to the fore when those ideals were threatened. Alexander treated both friends and enemies with respect, but demonstrated strong brutality when he felt betrayed.

In 340 BC, Philip appointed Alexander as temporary regent while he was away. The 16-year-old Alexander took the opportunity to launch a lightning attack against a rebellious tribe in neighbouring Thrace, winning a formidable victory. Philip was filled with joy and pride at his son's military capabilities.

A few years later, the two Greek cities of Athens and Thebes combined ►

### THE LEGEND TELLS...

### The horse

...that at age 13, Alexander was the only one who could ride the horse Bucephalus. When his beloved horse died during the campaign in India, Alexander founded a city there in the stallion's name.



MARY EVANS



# army overthrew its adversaries

**Infantry** - the so-called phalanx - was the Macedonian army's core, placed at its centre. The enemy was met by a wall of spears up to 4.5 metres long, which they had to penetrate to attack the heart of the Macedonian army. No force managed to defeat this incredible mobile stronghold.

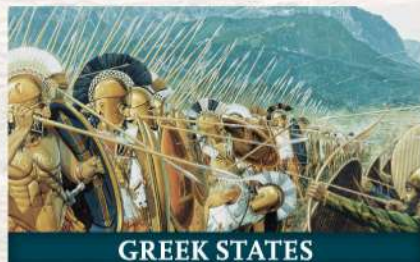
## ALEXANDER THE GREAT'S ARMY

The Macedonian army was made up of professional soldiers and the units fought together. The heavy army infantry represented its solid core, while cavalry attacked the enemy from the flanks.

**STRENGTH:** a professional, flexible and uncommonly mobile army.

**WEAKNESS:** long supply lines and a high dependency on Alexander himself. After his death, the army dissolved.

**Cavalry** was the Macedonian army's offensive force. The riders attacked the enemy in an effective wedge formation.

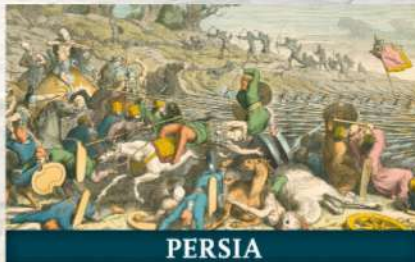


GREEK STATES

Greek armies were made up of hired soldiers. Its core strength was heavily armed foot soldiers. Cavalry existed in small numbers and was used defensively.

**STRENGTH:** well-trained heavy infantry.

**WEAKNESS:** few cavalry and therefore low mobility.



PERSIA

The Persian ruler could muster up to one million soldiers and sent countless cavalry, infantry and archers into battle.

**STRENGTH:** numerical superiority.

**WEAKNESS:** the army came from all corners of the empire and was not used to fighting together.



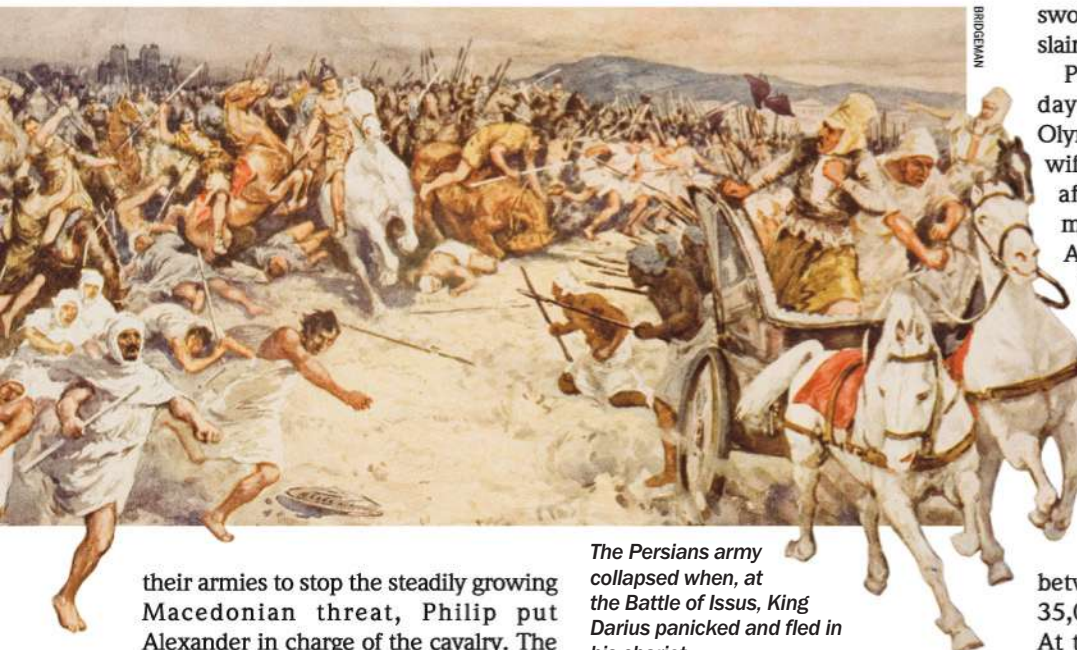
INDIA

The Indian army had both infantry and cavalry. Their most foreboding weapon was war elephants, which the Macedonians had never seen before.

**STRENGTH:** infantry and war elephants.

**WEAKNESS:** few cavalry, and therefore low mobility.





BRIDGEMAN

their armies to stop the steadily growing Macedonian threat, Philip put Alexander in charge of the cavalry. The armies clashed at the city of Chaeronea with Alexander leading the main attack, where he virtually wiped out the Greek forces, finally putting Greece under Macedonian rule.

The victory over Greece meant Philip was ready to realise his great ambition: an attack on the Persian Empire.

### Did Alexander murder Philip?

The joint expeditions brought Alexander and Philip closer than ever before. But as fate would have it, Philip – in the midst of preparations for the campaign against the east – fell in love with a young Macedonian woman. He then divorced Olympias, who went home to Epirus in a rage, and Philip married again.

According to the Greek historian Plutarch, the bride's uncle made a speech during the wedding feast expressing the hope that it wouldn't

*The Persians army collapsed when, at the Battle of Issus, King Darius panicked and fled in his chariot.*

be long before the wedding couple had a legitimate heir to the throne.

It was a deadly insult to Alexander, who had previously been seen as Philip's heir. In a rage, Alexander threw his wine goblet and shouted: "and what am I... You dare to call my mother a whore and me a bastard?"

Philip, full of drink, was furious at his son's reaction. He drew his sword and lunged at Alexander. In his drunken stupor, he stumbled and fell.

"See", said Alexander coldly. "This is the man who's going to take you from Greece to Persia? He can't even make it from one couch to the next".

He returned to his mother in Epirus. Father and son reached a reconciliation of sorts, and Alexander returned to Macedonia. But despite good intentions, their relationship was colder than ever.

While Alexander was away, Philip, who feared Olympias' plotting in Epirus, arranged a marriage between his daughter and Olympias' brother, the king of Epirus. It was Philip's last deed. When the king entered the theatre, where the wedding festivities were taking place, one of his bodyguards suddenly launched at him, piercing him with his

sword. In a moment, the murderer was slain by his fellow bodyguards.

Philip's murder is a mystery to this day. Some historians believe that Olympias, who murdered Philip's new wife and her young son immediately after his death, was behind his murder. Others suggest that Alexander had the most to gain.

What is certain is that in 336 BC – at only 20 years of age – Alexander was proclaimed king of Macedonia. Now it was his job to undertake the planned raid in the east.

### Alexander rode at the front

In the spring of 334 BC, Alexander crossed the Bosphorus between Europe and Asia with about 35,000 Macedonian and Greek troops. At the time, the Persian Empire was one of history's greatest empires including present-day Turkey, Egypt, Iran, Iraq and Afghanistan. The Empire had about 50 million citizens. Alexander's first encounter with the Persian army took place on the River Granicus, Biga Çayı in northern Turkey.

The Persians had fewer soldiers than the Macedonians, but had the advantage of a position on a very high riverbank. Despite their less favourable position, Alexander didn't hesitate to attack and rode at the head of the Macedonian cavalry. It was a matter of honour for Alexander to experience the same dangers and suffering as his soldiers.

During the battle, Alexander was attacked by two Persian horsemen. One hit Alexander's helmet with great force with his axe. But when the attacker prepared to strike a deadly blow against the young king, the Macedonian Cleitus the Black came to Alexander's rescue, cutting off the enemy's arm. The Macedonians' disciplined and resolute attack decided the battle's outcome. The Persian army was split and then almost destroyed.

After the battle was over, Alexander went to visit his wounded soldiers. "He tended their wounds... and invited each to tell his story", the historian, Arrian wrote. The Macedonian soldiers loved and adored Alexander because of this kind of care and personal attention.

**Army of 600,000 men were crushed**  
The Persian king Darius, mobilised a mighty army, brought together from all

### THE LEGEND TELLS...

### Philosopher

...that when Alexander met the ascetic philosopher Diogenes, who lived in a large barrel, the king offered him his every desire. The philosopher asked him to move a little and "stand out of my light".



BRIDGEMAN



corners of his kingdom. He even led the command when the army moved out of Babylon. Darius took his entire family, his harem and all his servants, while 600 mules and 300 camels transported the royal treasures. In the autumn of 333 BC, Darius moved into Asia Minor with his powerful army that, according to Roman historian Arrian, numbered up to 600,000 soldiers. He decided to meet Alexander near the town of Issus. It would prove to be a fatal error.

Darius could not have chosen a worse place. If the huge Persian army had room for manoeuvre, it would easily have encircled the entire Macedonian army, but it was sandwiched on a narrow strip of land between the Mediterranean and the Amanus Mountains, now called the Nur Mountains. Most of the Persian forces were packed tightly together behind the front ranks, standing in plain sight.

Alexander capitalised on the Persians' errors and gave the order to attack. While the infantry stubbornly pressed forward with their long spears towards the middle of the enemy lines, Alexander attacked the Persians' left flank at the head of the Macedonian ►

*When Alexander's friend Hephaestion died, Alexander had him cremated on a grand, funeral pyre 60 metres tall.*



ART: IMAGES

## Friends were Alexander's first love

Most historians now agree that the difficult relationship that existed between Alexander's mother and father destroyed young Alexander's relationships with women.

Instead, his male childhood friends were his great love. Many of them followed him on the campaign to the east and were some of his best generals and advisers.

Alexander's closest friend was Hephaestion, who Alexander loved

more than any other man. By all accounts the two had a sexual relationship. This does not mean that Alexander was necessarily gay: sex between heterosexual men was not unusual at the time.

When Hephaestion died in 323 BC, it left Alexander deeply sad and he cremated him on an ornate funeral pyre, measuring over 60 metres high. Only two months later Alexander himself died.

## A campaign to the ends of the earth

**Alexander led his army on a long march of almost 35,000 kilometres, all the way to the earth's known extremities. When the army crossed the river Indus, Alexander proceeded quickly, as he had heard that the end of their quest was in sight. But his soldiers refused to continue.**







cavalry, with his usual death-defying vigour. The violent attack came as a surprise to the Persians, whose left flank immediately began to crumble and shortly after, collapse altogether.

Encouraged by the success, Alexander led his cavalry directly into the middle of the Persian army, where Darius stood in his chariot.

At the sight of the booming Macedonians, the Persians panicked and fled. The nearest Persian soldiers ran first, breaking up the front lines. The entire vast army fled and thousands of Persian soldiers were trampled to death by their comrades.

As night fell, Alexander set off in pursuit of Darius and the remnants of his army. In the Persians' camp, Alexander found the King's tent, equipped like a palace with a toilet, furniture made from gold and precious

*The Indian war elephants were a scary experience for Alexander's soldiers as they had never seen elephants before.*

GETTY/ALL OVER PRESS

woods and a throne. In addition, the Persian king had left a huge treasure in gold and silver.

In a carriage nearby, the Macedonians found Darius' family: mother, sister, wife, son and two daughters. Alexander treated them with the utmost respect.

After his escape, Darius wanted peace. He offered to pay a huge ransom for his family and to give up any claim to land west of the Euphrates River.

Arrian wrote that Alexander discussed the matter with his officers. The old general Parmenion thought it was a good offer, "In Alexander's place I would enter into the conditions", he said. Alexander replied with a smile: "I would also – if I were Parmenion". Darius was told that his offer was rejected, and he started building a new army. On 1st

October, 331 BC, Darius' fate was decided at the decisive battle at Gaugamela in present-day northern Iraq. Darius' army was crushed, and he had to flee again. A few months later, Alexander declared himself the new king and set out to defeat the last pockets of resistance to the east.

The rugged Bactria in present-day Afghanistan caused the biggest problem. Macedonians fought fiercely against the local tribes, who held out for months. Eventually, they managed to end their resistance and Alexander's saviour – General Cleitus the Black – was appointed governor of Bactria.

General Cleitus, who had also fought under Alexander's father, was a part of the conservative Macedonian elite who did not approve of Alexander's almost godlike status. During a party, where Alexander was very drunk, the two men quarrelled. Cleitus accused Alexander of treating Macedonians worse than the

## THE LEGEND TELLS...

### The knot

...that at the city Gordion was a complicated knot. According to the myth, he who solved the problem of the Gordian knot would become ruler of Asia. When Alexander came, he sliced through the knot with a single sword stroke.



MARY EVANS



Persians, claiming that Alexander's success was solely down to Philip's planning and the soldiers' bravery.

"This army's your blood! Without it you're nothing!" Cleitus shouted.

Alexander was furious and had to be restrained. But when Cleitus continued his insults, the king grabbed a spear and stabbed him in the chest. The murder shook all Macedonians, but Alexander was particularly unnerved. Arrian wrote that he would neither eat nor drink for three days. More critically, his reputation as an infallible commander had suffered irreparable damage.

### The soldiers refused to go on

In 327 BC, Alexander led his army across the border into India. The following May, he dealt a huge blow to the Indian king Porus, defeating him and his intimidating war elephants.

The long march east continued, but after a few months of endless battles against local tribes, the unthinkable happened: Alexander's soldiers refused to go on. After eight years of constant struggle and thousands of kilometres of marching they wouldn't go any further. According to Arrian, Alexander immediately called the army together and delivered a fiery speech in which he reminded the soldiers about their great victories. He pointed out that he had always endured the same suffering and always shared the spoils.

"Isn't it a lovely thing to live with great courage and to die leaving an everlasting fame?" he said.

An old Macedonian soldier, Coenus stepped forward on behalf of his comrades. He said that the soldiers could not complain about Alexander's generous rewards. He continued to talk about the many comrades they had lost in combat or from disease, and the soldiers' yearning to see their wives and children. According to Arrian, the soldiers cheered and as Coenus finished his speech, they wept.

For three days, Alexander sulked in his tent while secretly hoping that the soldiers would change their mind. They did not, and Alexander gave the order to retreat. He had lost for the first time.

### Death came suddenly

After months of gruelling marching, the army reached the Persian capital of Persepolis, Alexander held a big banquet to celebrate the conquests and

bring Macedonians and Persians closer together. At a lavish wedding ceremony, he married his second wife, Darius' daughter Stateira. At the same time, by Alexander's order, a further 80 senior officers and 10,000 Macedonian soldiers married Persian women.

After the party, Alexander went to Babylon to tackle the enormous task of organising his new empire, but he did not get far. Suddenly, he was hit by a violent fever, which might have been through poisoning, but was more likely due to natural causes – possibly malaria or typhoid fever. After ten days, the young king was so weak that he could barely speak. His most trusted generals gathered around his sick bed.

Outside, rumours started spreading, and the Macedonian soldiers demanded

to see their king. Fearing revolt, the generals eventually let the soldiers into the palace.

According to Arrian, the men went into mourning and in one long line, filed past the dying king who struggled to lift his head to send a silent greeting to each one of the soldiers, with whom he had conquered the world.

At sunset on 10th June 323 BC, Philip and Olympias' son, died. Alexander III of Macedonia was only 32 years old. Posterity remembers him as Alexander the Great. ■

### FURTHER READING

• Paul Cartledge: *Alexander The Great – The Hunt for a New Past*, Macmillan, 2004 • Mary Renault: *The Nature of Alexander*, Penguin Books, 1975 • Nicholas Saunders: *Alexander's Tomb*, Basic Books, 2006

## Alexander's family was killed

**The young king's death in 323 BC sparked a bloody power struggle. All of Alexander's family, including his young son, were killed.**

Alexander had no children during his lifetime, but his first wife (the Bactrian princess Roxana) was pregnant when he died. She summoned Alexander's second wife Stateira and murdered her. Then Roxana travelled to Macedonia with her newborn son.

Alexander's mother Olympias had seized power in the country and ordered Alexander's retarded brother, Philip Arrhidaeus, killed. The bloodthirsty queen also murdered all her enemies within Macedonian nobility.

Soon the throne was taken by Cassander, the son of one of Alexander's generals. In 316 BC, he

ordered his soldiers to execute Olympias, but he could not bring himself to kill her. Instead, he left her to the wrath of her own victims' relatives. According to sources, she didn't utter a single cry of pain as they stoned her to death. Shortly afterwards, Cassander murdered both Roxana and Alexander's son.



Shown here at her wedding, Alexander's first wife, Roxana was a tough lady, but she couldn't manage to save the couple's child.

## Power struggle split new empire in three

After Alexander's death in 323 BC, his generals engaged in a bloody struggle for power over the vast empire. The result was that the kingdom was divided into three, each with a general ruling it: Macedonia, the Seleucid Empire and the Ptolemaic Kingdom. Both the Seleucid Empire and the

Ptolemaic Kingdom lasted under Macedonian rule for almost 300 years, before they were overrun by the Mediterranean's new superpower: Rome. During Macedonian rule, Greek culture, art and philosophy spread throughout large parts of Asia, the Middle East and North Africa.



**DRAMATIC  
DISASTERS**

# PLAGUE, TERROR AND TRAGEDY

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When a German submarine sank the luxury steamer Lusitania, the United States joined WWI and the war turned. The attack on the World Trade Center on 11th September 2001 spread fear in the western world. Disasters, terrorism and epidemics set the agenda for world leaders.

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Mass graves reveal the  
mystery behind

# The

**Bones from plague victims found in five mass graves show that the Black Death was caused by a bacterium. In a matter of years, the plague claimed millions of lives across Europe.**

POLFOTO/TOFFOTO & POLFOTO/PHOTOAISA



# black death

*In the mid-1300s the plague swept across Europe, leaving mass graves and deserted villages in its wake. In despair, medieval people resorted to a variety of imaginative explanations for the deadly disease. Only now, more than 650 years later, can scientists identify the cause of the Black Death and explain how it spread.*

## EUROPE/1300s

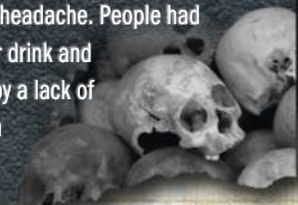
All of Europe is in crisis. Winters are long and harsh, summers are rainy. The harvest fails again and again, leading to widespread famine. Then in 1347, the population of southern Europe start dying from an unexplained illness.



## FOUR PHASES OF THE PLAGUE:

### 1. Soreness and coughing

When the plague hit, it typically started with people complaining of soreness in their lower back and muscles, followed by bouts of dizziness, a dry cough and a severe headache. People had no desire for food or drink and were overwhelmed by a lack of energy, forcing them into their beds.





When the merchant vessel from the French province of Gascony docked in Bristol, you could hear the ropes and planks creaking on deck. A cargo of barrels lay side by side, filled with wine from the fields around Bordeaux. The trip across the English Channel was eventless, although the summer weather in 1348 was humid and riddled with showers.

When the crew had unloaded the barrels and been paid, the ship set sail south to the port of Melcombe Regis (now part of Weymouth). Along the way, one of the men began to cough violently, while others complained of a sore neck and lower back.

After a few days, when the ship reached the English coast, several crew members were then so weak they could barely stand. They hurt all over, feeling dizzy; their skin burning with fever.

The natives of Melcombe had no idea that something strange was going on when the ship from Gascony sailed into the harbour. All they saw was a peaceful merchant ship loaded with good southern wine and spices from distant, foreign lands. People huddled on the pier to hear news

about King Edward III's war in France, but their curiosity soon turned to horror.

The crew had turned up with more than wine and spices: they also carried a deadly cargo that many had heard of, but few dared mention. Within days, Melcombe was hit by the dreaded plague. No one would be spared as fever and painful abscesses spread from house to house.

The plague – the Black Death – had reached England.

### Doctors and priests were powerless

When the plague reached English soil in the rainy summer days of 1348, it had been raging across most of central Europe for nearly a year.

The disease first appeared in Europe in Sicily, where people started with a violent fever along with bloody vomit or painful abscesses under their arms. The gates in several Italian cities were closed in panic and in March 1348, travellers were denied access while the Venetian doge isolated the sick and visits to quarantine stations outside Venice.

Despite all attempts to quell the spread of infection, it moved quickly to the rest of the European continent.

### FOUR PHASES OF THE PLAGUE:

## 2. Vomiting and thirst

Plague sufferers had persistent vomiting and violent diarrhoea. The skin burned hot and was sensitive to the touch. This caused dehydration with the patient begging for water, even if he could not hold it down. Pain and thirst pushed the sick to the edge of insanity.

Often plague victims died so quickly that the survivors did not live long enough to bury the victims before they were hit themselves. Instead, corpses lay in the streets, where stray pigs and packs of dogs rummaged through the abundance of plague-ridden bodies.

Experts were confused as they could not explain where the plague had come from or what had caused the infection. Therefore, they resorted to explanations to diffuse the situation saying that the plague hit people with a "hot and humid temperament" or young girls "with a penchant for frivolity".

The doctor, Simon de Covino like every other medieval physician, was no good at controlling epidemics. Instead, he could only conclude that "pastors

## A cunning scheme spread plague

The Black Death was virtually unknown in Europe until Italian merchants were bombarded by plague-ridden bodies in the Black Sea.

Until 1347, most Europeans lived in blissful ignorance of the plague. But a cunning scheme on the Crimean peninsula on the Black Sea accelerated the deadly disease on its course towards Europe.

For years Italian merchants had driven trade through the Black Sea, but the relationship between Italy and the locals – the Turkish Tatars – became progressively worse. After a deadly brawl between members of both groups, the Tatars had had enough of the foreigners. In the mid-1340s the local army besieged the Christian port city of Kaffa in the Crimea peninsula.

The situation was in deadlock for three years, until the Tatars were struck by a mysterious disease that killed thousands every day. "It was as if arrows rained from the sky with an aim to crush Tatar

arrogance", wrote medieval chronicler, Gabriele de 'Mussi about the sudden outbreak of plague. "All medical care was useless. Tatars died as soon as they showed any sign of the disease: swellings in the armpits and crotch, and a burning fever".

Instead of abandoning the siege, the Tatars decided to use the plague to their advantage. Shortly afterwards, Kaffa was swamped with plague-infected corpses, which were fired over city walls with catapults. The effect was overwhelming. Soon, all of Kaffa's citizens were infected with the plague.

In October 1347, surviving Christian merchants fled by sea to the Sicilian town of Messina, taking "the Asian plague" with them. It would soon be rampaging unchecked through Europe.

**For several years Tatars tried to take the city of Kaffa. The plague helped them to victory.**



and doctors were hit by the epidemic while they gave spiritual support and guidance. Often, just a touch or a single breath from the plague victim struck them down; even before reaching the person they had come to help”.

### Mass grave reveals bacteria

Since the Black Death's sudden devastation throughout Europe, historians and doctors discussed how the disease could spread so quickly. While other infectious epidemics such as tuberculosis had not spread at the same rate and taken so many lives. For centuries, the debate has given rise to various theories, and according to one, the Black Death was not the plague, but an anthrax or ebola-related virus.

In October 2010, an international team confirmed that the Black Death was indeed a plague. The final proof came from a large number of skeletons found in medieval mass graves in England, France, Germany, Italy and the Netherlands. For years, scientists had uncovered graves and analysed DNA and proteins from the dead bones. Investigations revealed that one particular bacterium was present in all of the graves: the hyper-aggressive plague bacterium, *Yersinia pestis*.

The new research served to confirm what medieval historians such as Professors Michael Prestwich and Nicholas Vincent already believed, that *Yersinia pestis* was the cause of the epidemic which desolated Europe in the Middle Ages.

### Plague attacked from the north

Investigation of the mass graves offered further surprises. While the French, Italian, German and English bones showed the same variant of the plague bacterium, the result of the Dutch mass grave near the town of Bergen op Zoom was markedly different.

“This epidemic story is more complicated than we previously thought. Our findings indicate that the plague travelled to Europe by at least two different routes and subsequently evolved in different ways”, explained anthropologist Barbara Bram Anti from Johannes Gutenberg University in Mainz, who participated in the analysis of the Dutch bones.

Until now, historians had assumed that the people of Bergen op Zoom had

been infected by itinerant English and French soldiers during the Hundred Years' War (1337-1453). However, the latest DNA analysis has led researchers to believe that the Dutch were probably infected from the north via Scandinavia or from German Hanseatic towns, as Bergen op Zoom was a thriving trade centre at the time.

This contradicts the traditional notion that the plague came to Europe via the Mediterranean. Scientists can now also begin work to identify how the plague spread within Europe.

### The infection originated in China

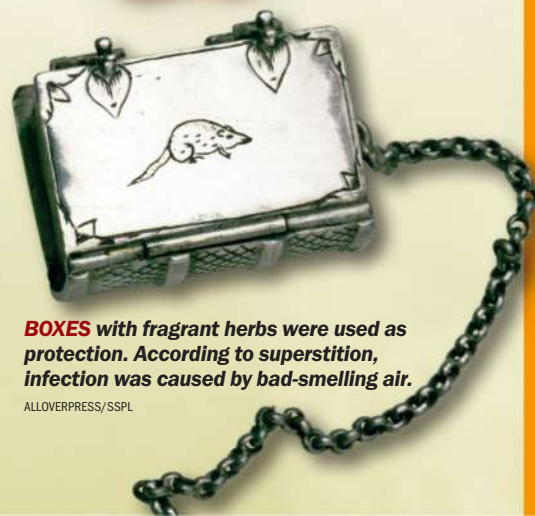
In the five mass graves, researchers also found two novel variants of the plague ►

**A SCORCHING ROD** was used by doctors for cleaning and cauterising patients' infected boils.

SCIENCE & SOCIETY

**A PLAGUE DOCTOR** was hired by the worst-hit cities. The doctors were mostly young and inexperienced. Their masks contained fragrant herbs, which they hoped would protect them against the plague.

GETTY IMAGES



**BOXES** with fragrant herbs were used as protection. According to superstition, infection was caused by bad-smelling air.

ALLOVERPRESS/SSPL



# Plague had several routes

Until now, scientists believed the plague came to Europe via the Black Sea spreading north. The discovery of a new variant of plague bacterium in the Netherlands suggests that it invaded Europe through the German Hanseatic towns or Scandinavia too.

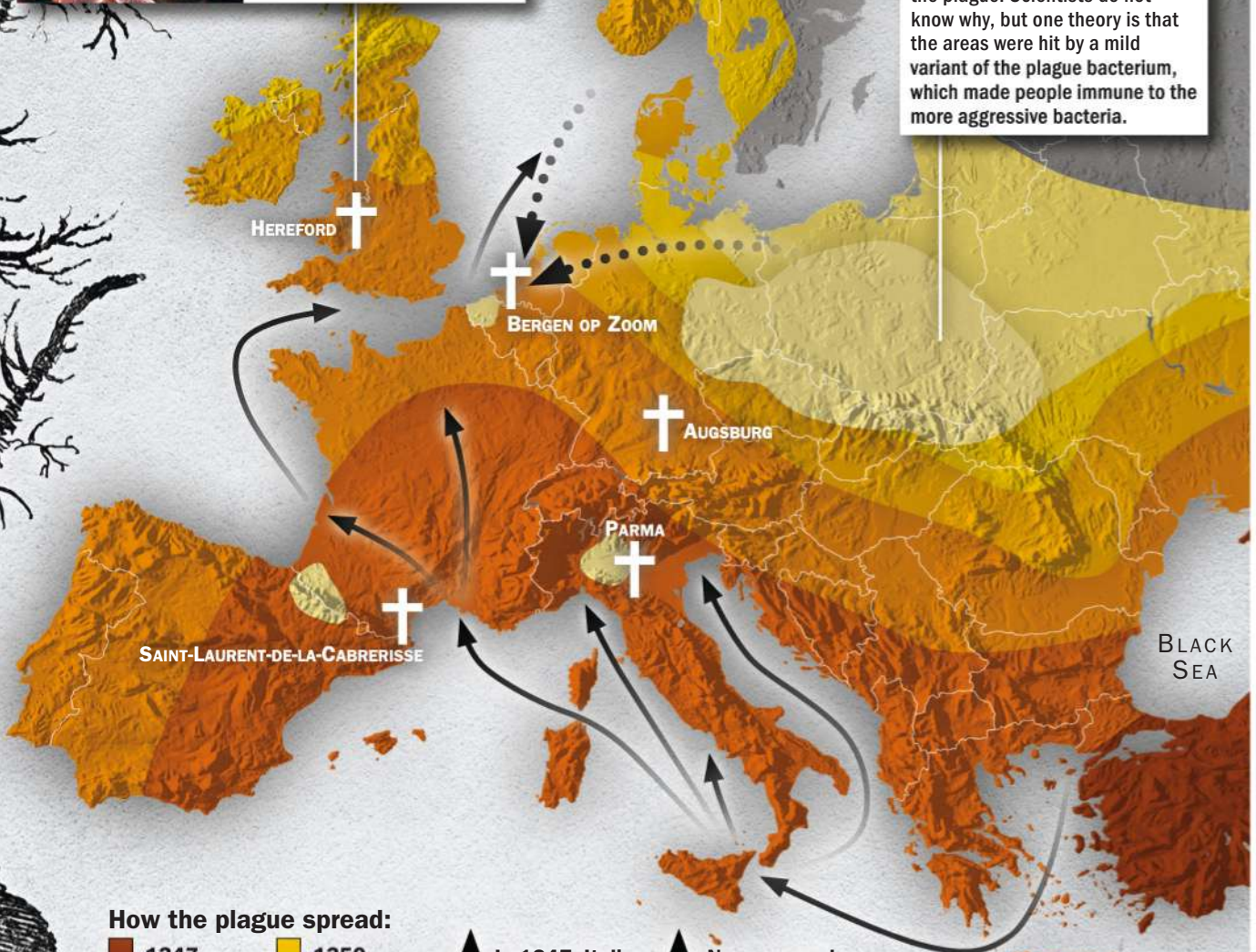


**Yersinia pestis** is the cause of the plague, spreading through sneezing, coughing or contact. Without treatment, the bacteria is deadly, but can be controlled with antibiotics.

## The plague's route to Scandinavia is unclear.

According to folklore, a ship full of plague hit Jutland in 1348-49, from where the infection subsequently spread. Another report says that in 1349, a ship docked in Bergen with a plague-struck crew. It's thought that the plague killed about a third of the population in Denmark, Norway and Sweden.

**Some areas** of Europe escaped the plague. Scientists do not know why, but one theory is that the areas were hit by a mild variant of the plague bacterium, which made people immune to the more aggressive bacteria.



## How the plague spread:

1347	1350
Mid-1348	1351
Early 1349	After 1351
Late 1349	Few outbreaks

↑ In 1347, Italian merchants brought the Black Death into Europe.

▲ New research suggests that the Black Death also reached Europe from the north.

✚ Scientists have studied five mass graves of plague victims.





#### FOUR PHASES OF THE PLAGUE:

### 3. Nose bleeds and sores

A patient with bubonic plague became inflamed under the arms and in the groin. The inflammation built up, turning into abscesses as big as chicken eggs. In pneumonic plague, the disease caused wheezing and bloody, lumpy vomit full of black slime. Some also had nose bleeds.

bacterium. One variant is now extinct, while the other is similar to types of bacteria found in Asia today. This discovery supports the idea that the plague bacterium in the European mass graves originated from Asia and, more specifically, China.

"We know that the bacteria originated in China and that it has always been present in China. Therefore, it is logical that it comes from China. However, we do not know how the Black Death reached Europe", says microbiologist Mark Achtman of University College Cork, who studied the plague bacteria in the mass graves.

The new discoveries confirm one of the medieval world's assumptions: that the plague had come from the Far East. When the plague struck Europe in the 1340s, apocalyptic theories told of how a natural disaster had transmitted the plague from Asia to Europe. For example, immediately after the plague outbreak, the Italian chronicler Gabriele de 'Mussi wrote:

"In East Cathay (China), the largest country in the world, horrific and terrifying characters showed themselves. Snakes and toads fell in a thick rain occupying settlements and devouring countless people as they

**The death toll from the plague was so high that wagons and oxcarts collected up the dead, and subsequently threw the bodies into large mass graves.**

GETTY IMAGES



poisoned and gnawed at them with their teeth".

In a letter sent from Avignon, the Flemish canon Louis Heyligen told of similar horrors in India where "it rained frogs, snakes, reptiles, scorpions and similar venomous animals".

#### Rats moved to the cities

Today, researchers do not believe in the theory of contagion via poisonous vermin. Scientists and

historians alike agree that a series of natural disasters in Central Asia led to plague-infected rodents moving from isolated areas to more densely populated parts of the country.

Both China and Mongolia suffered upheavals in the 14th Century as a result of droughts, flooding and earthquakes. In the early 1330s, the first record of an epidemic believed to have been the plague was recorded in northern China.

A few years later, China was shaken by a "subterranean thunder", and travellers told of huge earthquakes where "all the mountains disappeared and gigantic canyons arose".

The earthquakes led to violent volcanic eruptions and "a massive rain of fire that fell in flakes like snow and burned mountains and steppes. Afterwards, there was a lot of smoke and everyone who saw this, died within half a day", a European chronicler claimed in 1350, when the plague had Europe in its grip.

One consequence of these disasters was that large locusts scrambled to eat their way through impoverished farmers' crops. At the same time rodents – the black, oriental rat – left the disaster areas and migrated westward in search of food. The fur on the fleeing animals was covered in bloodsucking fleas, and helped to spread death and terror across most of Europe. The flea's blood contained the germ of ▶

### Medieval "cures" for the plague

In 1347-50, doctors still practiced Hippocratic medicine that said diseases were caused by an imbalance in the body's four so-called cardinal fluids: blood, phlegm, yellow bile and black bile. A widely used "cure" was bloodletting, whereby the patient was drained of "useless" blood, so the body could provide new, vigorous blood.

Among the more specialist cures for the plague were laxatives, which would drain the body of ailment, or strong tonic so the patient sweated out the disease. A popular tonic consisted of powdered eggshell, beer, syrup and petals. Another recommended drink was urine.

Some doctors swore by a treatment in which the patient was wrapped in a mercury sheet and put in a sweat box. When conventional medicine was not enough, desperate plague sufferers resorted to witchcraft. One method was to sleep with a live hen that, according to superstition, would take over the disease.

Non-infected people could protect themselves against the plague by avoiding the bad-smelling air, considered to be a source of infection. They used strong perfume or hung small boxes filled with fragrant herbs around their neck. Or they could sit near a sewer, so the bad air from the plague was displaced by the sewer's fouler odour.



**Bloodletting was a treatment for plague. In theory, the body would form new, plague-free blood.**





SCANPIX/GRANGER

**Across Europe, thousands of Jews were thrown on the fire. Rumours said they were behind the plague.**

## Jews were burned alive

Medieval Europeans did not know the cause of the plague epidemic. Their ignorance gave rise to a wide range of imaginative explanations and malicious rumours. One of the most enduring stories told that the Jews had poisoned a large number of wells with plague to hit back at Christians.

The stories led to extensive witch-hunts for Jews across France, Germany and Italy where they were captured and tortured until they “confessed” that they had poisoned the water. They were then burned alive.

In the 1300s, the French abbot, Gilles Li Muisis witnessed Jews’ persecution: “In 1349, Jews were seized, chained and imprisoned. The reason for this was a strong suspicion that they planned to destroy the Christians by means of poison, and that they had secretly poured poison into wells, springs and rivers so that Christians would drink it”.

In Germany, the Jewish minority in the cities of Mainz and Cologne were eradicated in August 1349, the same year about 2,000 Jews were killed in Strasbourg. Two years later, 60 larger and 150 smaller Jewish communities were wiped out across Europe.

In some places, lepers were also burned alive because they were considered to be the Jews’ accomplices.

the plague – the bacterium *Yersinia pestis*. The disasters in Asia went on for more than 10 years and when the plague finally petered out in China, it had taken up to 20 million human lives. The infection spread quickly from east to west by sea and by the Silk Road trade route, where it reached first the Black Sea and then the Middle East.

### The plague was unpredictable

In 1347, the Black Death took its first victims in Europe. First came the earthquakes and tsunamis, which affected a number of Greek, Cypriot and Italian cities and the terrified medieval population interpreted the plague and natural disasters as God’s punishment and a sign that the apocalypse was near. People were even more certain of God’s wrath, when in the aftershock, church bells started to chime by themselves.

The theory of a divine punishment was further reinforced by the fact that whole cities or rural areas were not affected by the plague at all. For instance, individual villages in England were spared, while the population in neighbouring towns were sometimes reduced drastically. Much of Central Europe didn’t see the plague, but several Italian cities lost over half of their population. Contemporaries felt the plague showed a random scattering pattern that reinforced the belief that God held the hand of the pious and punished the faith of the weak.

Modern scientists have no explanation as to why the plague spread so unevenly, but its sporadic nature may explain why contemporary authorities found it so difficult to combat the infection. The Black Death was unstoppable, left to follow its own unpredictable path.

### Church forbade communal baths

To appease God, the Catholic Church urged people towards a more ascetic life without drinking, fornication and gambling. Tens of thousands went on a pilgrimage to gain God’s favour, while others volunteered for various processions of flagellants, marching and chanting across Italy, France and Germany. Although the pious pilgrims and flagellants sought to stem the plague by their actions, they actually contributed to its spread.

Without realising it, pilgrims brought plague from town to town, while

flagellants, who whipped themselves till they bled in order to mitigate God’s anger, lived in dirt and grime. As a result, blood, wounds and vermin provided a fertile ground for *Yersinia pestis* and hygiene became worse when the church closed the public bathhouses, because church leaders believed that the baths inspired unbridled drunkenness and adultery.

At that time, personal hygiene aroused great suspicion, because people believed that the moisture from washing encouraged the plague to flourish. This fear of cleanliness, coupled with the piles of rotting food and rubbish dumped in the streets by shopkeepers and householders, gave *Yersinia pestis* free rein to spread.

### The seasons tricked doctors

Nevertheless, the plague’s explosion cannot be explained purely by a lack of hygiene. Research shows that the infection was so insidious that, depending on the season, it switched from bubonic plague to pneumonic plague and back again.

For several years throughout the 1340s, summers had alternately been extremely dry or affected by torrential downpours, while winters were either bitterly cold or surprisingly warm.

Medieval physicians didn’t stand a chance of working this out, because

**In desperation, in the 1800s, the Chinese authorities set fire to houses that had belonged to plague sufferers.**

SCANPIX/SPL



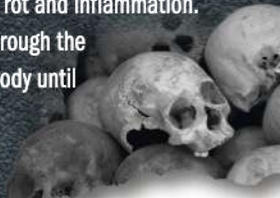


#### FOUR PHASES OF THE PLAGUE:

### 4. Fever and death

The pounding fever made life hell. The pus-filled abscesses burst, oozing festering, stinking pus and blood everywhere. The sick were surrounded by an awful stench of rot and inflammation.

Violent fever raged through the patient's weakened body until death finally ended their suffering.



during a warm spell the plague showed itself with painful boils, yet during a cold period it transformed into a cough.

The symptoms that doctors could observe were the ones they saw with their own eyes: some infected people went to sleep healthy, never to wake again, while others got large abscesses and died several agonising days later. Anyone ill with the plague, even beautiful women, were met with disgust because of the unbearable smell, which was caused by the disease.

In their delirium, the most desperate wretches cursed God or threw themselves into the river to cool the burning fever, while others were seized by a wild frenzy.

"In Provence, a man climbed onto the roof of his house and threw bricks onto the street. Another danced on his

roof; mad and grotesque", says a contemporary source, while the Parisian doctor, Simon de Covino noted that the Black Death "had irritated all doctors, and that Hippocrates' teachings were useless".

Neither doctors nor clergy could provide a cure for the plague, and within a few years up to one half of Europe's population had died. The plague had not only hit the malnourished, poor and

peasants who slept together in unsanitary housing, it also ravaged the upper classes, turning the social order upside down. Because of labour shortages in some parts of Europe, peasants had the opportunity to demand higher wages, and the feudal system began to break down. When the plague eased in about 1351, a microscopic bacterium from a flea had sent millions of Europeans to their grave.

It was not over. The plague returned to ravage Europe again several times over the following 400 years. One of the last outbreaks was in northern Europe in the early 1700s, which killed a third of the population in Stockholm, Malmö and Gothenburg. ■

#### FURTHER READING

- John Hatcher: *The Black Death*, Phoenix, 2009
- Susan Scott & Christopher Duncan: *Return of the Black Death – The World's Greatest Serial Killer*, John Wiley & Sons, 2004
- Philip Ziegler: *The Black Death*, The History Press, 2010

## The plague still lies in wait

**In 1855 a new plague epidemic spread across the globe. In China and India more than 12 million died of the bubonic plague.**

As late as the 1850s, the world was hit by another global plague. The disease began in China's Yunnan province and spread quickly. Because of religious unrest it sent hordes of carriers on the run to more densely populated areas. In the 1890s, infection reached port cities like Canton and Hong Kong and from here, the plague spread easily through the busy shipping routes and across the globe.

In Europe in 1897, panicked health authorities met to plan how to avoid a repeat of the Black Death. This time the Plague bypassed Europe, but in Asia it took millions of lives. The total number of dead is unclear, but in China and India alone, 12 million lives were lost

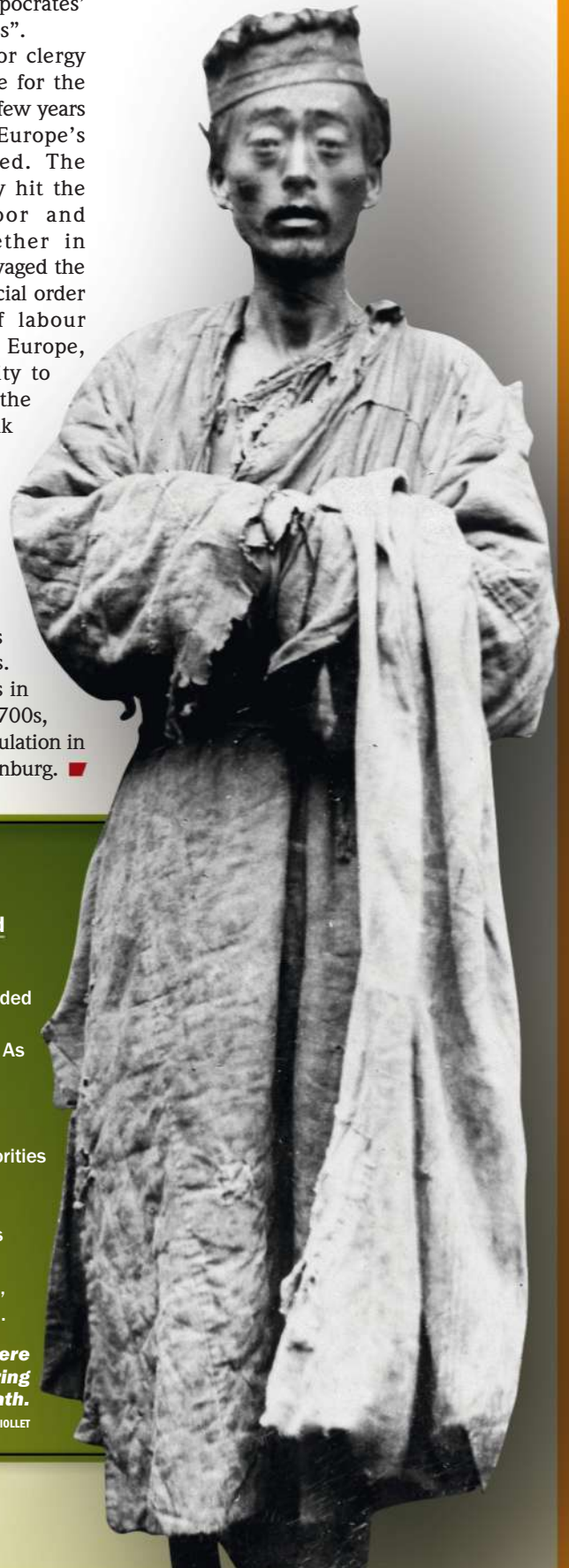
before the epidemic finally subsided in the 1950s.

The plague is far from extinct. As late as 1994, severe flooding in India started a new epidemic causing 300,000 people to flee. Prompt intervention by the authorities stifled the infection and only 52 people lost their lives.

In the past decade, authorities have registered plague-related deaths particularly in USA, Brazil, Libya, China, Indonesia and Peru.

**Millions of Chinese were hit by the plague, suffering a painful death.**

POLFO/ROGER-VIOLETT







**The whole of New York  
was paralysed when  
without warning, terror  
struck the city.**

REUTERS/SCANPIX





# TWO PLANES DESTROY LIVES

*The sky is blue and the air is clear as ice. Then, just 17 minutes apart, two planes plough through the World Trade Center's twin towers in New York. Meanwhile, millions of people watch horrified as – for 102 agonising minutes – thousands of people struggle for survival.*



**D**ianne DeFontes is the first to arrive at the law firm Drinker Biddle & Reath on the morning of 11th September, 2001. It's 8.30 when she enters, locks the door behind her and changes into her stilettos. From a small window in the World Trade Center's north tower, she takes in the bright blue September sky. The view over Manhattan from the 89th floor is spectacular.

From her window, DeFontes can see the Empire State Building and Midtown's other distinctive skyscrapers. The 51-year-old receptionist takes a sip of her coffee from more than 300 metres above New York's streets. She eats her yogurt and picks up the day's messages for the lawyers. Colleague after colleague filters into the office for the 8.45 start. Some are getting coffee, others are already sitting behind their screens.

The day starts like any other. More than 14,000 people are already here, barely a third of the nearly 50,000 who work in the twin towers. Everything from charities to multinational banks are based in New York's 28-year-old landmark.

There are staff at the top of the tower and other staff in the restaurant Windows on the World too. From the top, the view is magnificent, and employees are having breakfast there.

The north tower's upper floors don't simply house the offices of financiers and lawyers, but also studios for a large number of artists.

The owners of the building have given them free space, and World Trade Center is not only a financial centre, but also a preferred venue for Bohemian society in New York.

The working day at the World Trade Center has begun.

## Death comes from Manhattan

**08.46: New Yorkers look on, amazed as a passenger plane at low altitude flies over Manhattan and towards Downtown.**

North tower: the architect who designed the World Trade Center suffered from acrophobia. He designed the building with his phobia in mind – the windows of the marathon-sized building were made small and narrow. The idea behind it was that if you can grab a wall, the fear will fade. Because of this, the view over Manhattan was restricted, and people inside can't see the amazed looks on the faces of the

thousands of New Yorkers on the street as they look up at the clear blue sky. From as far away as Manhattan and the Hudson River, residents could see a passenger plane, first passing Central Park and then the Empire State Building. The sight was highly unusual – in fact, downright strange.

For safety reasons, passenger planes were not allowed to fly over Manhattan – keeping both passengers and buildings safe. In seconds, the spectacle turns into an unbelievable reality as people on the street begin to perceive the disaster that is about to unfold. For no apparent reason, the aircraft heads directly towards the World Trade Center's north tower.

Without warning, the huge machine, filled with people and thousands of tons of kerosene hits the 93rd floor, cutting through steel, metal and concrete with its lower wing. The other wing cuts through the 98th floor. For hundreds of people, death came quickly, with a deafening sound. The

**New Yorkers look on in horror, while people in the two towers fight for their lives.**

GETTY IMAGES





first to die would prove to be the lucky ones. The collision is so powerful that the remains of a man who worked for the financial firm Marsh & McLennan, is hurled more than five blocks away, while the aircraft's landing gear continues through the building and out over the street. It crashes into the nearby Church Street with such inexorable force it soon becomes clear what had hit the tower.

After having flown the 21 kilometres from Manhattan's northern tip to its southern tip in less than two minutes, American Airlines Flight 11 hit the World Trade Center at 725 km/h. It was one thing to drop its landing gear and hurl a man one quarter kilometre through the air, yet the impact the collision had on the building was quite another.

As American Airline's plane and its 92 occupants crash into the tower, it takes just a split second to come to a standstill, demolished. The powerful impact of the strike sends tremors through the shell of the north tower and pulsates on through Manhattan's subway where the earth shakes, and then on into the Atlantic Ocean and the Hudson River.

Over the next 12 seconds, the tremors are measured 35 kilometres away on seismographs at Columbia University. The earth quakes from the force of the impact. You didn't need a seismograph to see the damage inside the tower. Tons of kerosene explode and flames engulf the elevator shafts down to the lobby, while the north tower's upper floors break out in an unstoppable fire.

## Fire protection does not work

**08.50: a plane hits the north tower of the World Trade Center. The collision leaves elevator shafts in flames and escape routes in ruins. Anyone higher than the 93rd floor is trapped in a burning prison, filled with heavy black smoke.**

North tower: the ceiling collapses in the corridors of the 88th floor. An empty gaping hole now stands where the building's three elevators once were. Even a few floors below where the plane hit, two of the three stairways are filled with flames and smoke. Men and women run from their offices. Flames lick up the walls and the intense heat burns their skin.

While the heat is intense, yet bearable on the 88th floor, the floors above the



**Distressed people gather at the windows.**

## Victims gasp for breath

About 2,000 people were trapped in the World Trade Center's towers when a plane ploughed through the floors below them. Fire filled the building with smoke and the helpless victims broke windows for air so they could breath and pleaded for help from the people outside.

The disaster happened just as the New York stock market was about to open.

Bankers and brokers stood ready to start their day's trading, but the explosion put paid to all thoughts of any profit that day.

The Risk Waters Group was in the Windows on the World restaurant at the top of the north tower when the first plane hit. The company had organised a financial technology conference and had arrived early for a staff meeting.

impact site are being swallowed by a thick, black smoke. The World Trade Center was designed with smoke-tight floors: like ships have watertight bulkheads so penetrating water cannot flow freely throughout the ship, the World Trade Center was designed to isolate fire and smoke on each individual floor. But now that the architectural plans are put to the test, the system has failed: smoke and flames spread upward and unrestrained with deadly effect. From the south tower, horrified employees watch as a man rips off his burning shirt and jumps to his death. Only two minutes have passed since the plane hit, and fire and smoke is already spreading everywhere.

North tower: in the Windows on the World, 25-year-old Bloomberg employee Peter Alderman sends a text to his family: "I am SCARED – there is a lot of smoke", it reads. Alderman has been in a morning meeting at the restaurant on the top floor and is now trapped. Even here, 60 metres above the point of impact, the smoke is suffocating. During the first 10 minutes after the explosion, police and

fire departments receive more than 3,000 calls from people trapped in the building asking for instructions and begging for help – testimony that reveals from the outset, the disaster was catastrophic.

Calls from employees in the Windows on the World become more and more desperate. People are begging for help to get them out from "where the smoke is so dense and suffocating". But emergency services on the ground don't have an overview of how the fire is developing, and even if they had, it would not have helped. The brutal truth is that there is no escape. Even though the messages that are sent back are reassuring, they're a death sentence for the people in the restaurant. "We have people coming up to you. Do not panic. There is help on the way."

## No one can rescue the trapped

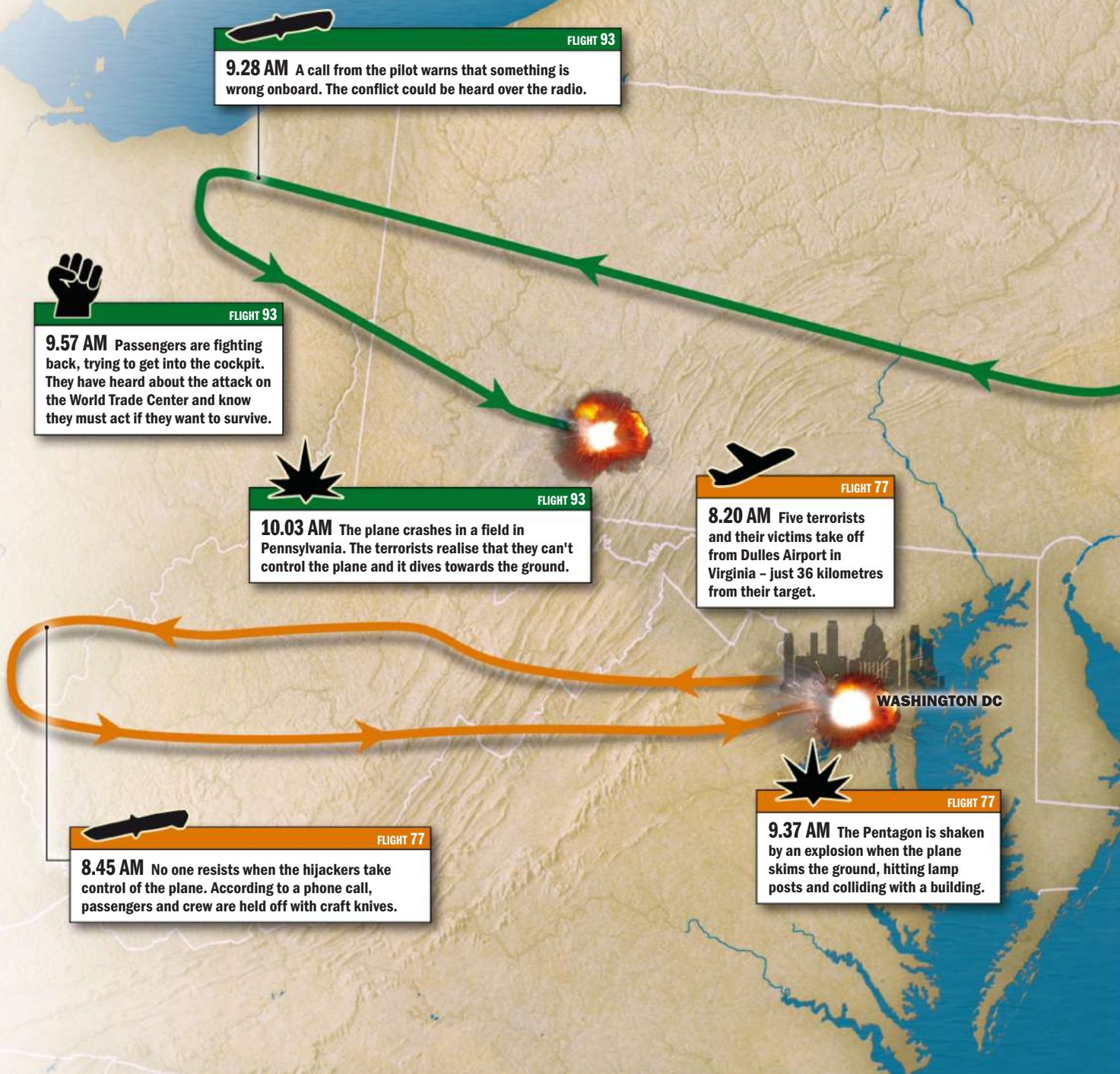
**08.54: the first firemen arrive to what would prove to be the biggest rescue operation in New York's history. Even servicemen grab their clothes and head for the World Trade Center any way they can: on ►**



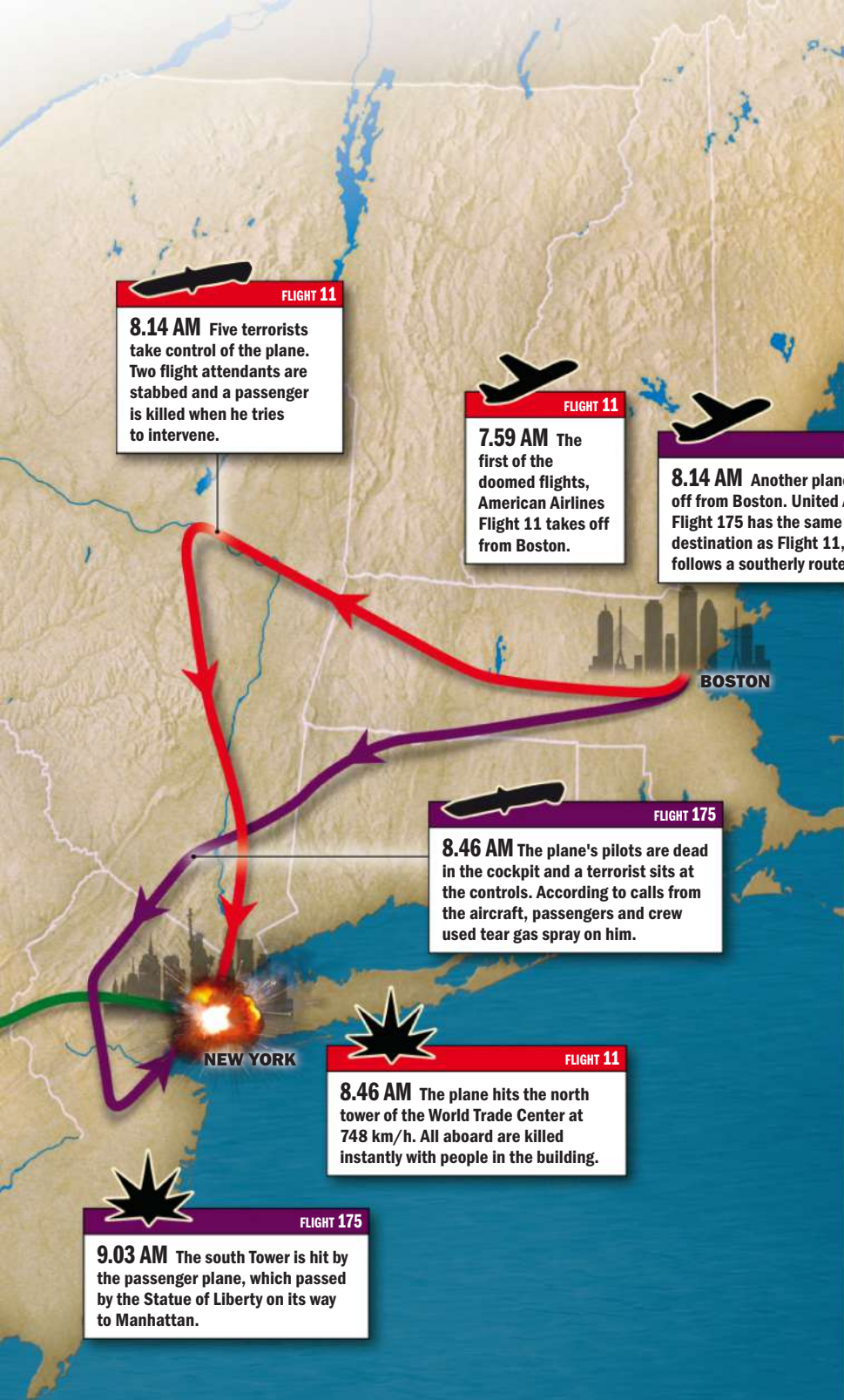
# How four planes were turned into murder weapons

On the morning of 11th September, the sky over the United States was – as always – filled with planes. The cabins were filled with business men on their way to meetings and families heading home from the holidays. 231 of them would never set foot on the ground again.

CLAUS LUNAU/HISTORIE







*the subway, in cars or by taxi. More than 1,000 servicemen report for duty. The number of rescue personnel is so great that traffic is at a standstill and parking impossible.*

North tower: the sight that awaits the first rescuers is appalling. In the lobby, jet fuel has burned through elevator shafts leaving large blackened holes several hundred metres below the 87th floor. Windows are shattered, marble walls cracked and burned people are being helped out of the building.

Even an amateur can see that the task ahead is impossible. Heading up 87 floors, dressed in full protective clothing, with stairwells full of people would take hours. The assessment was clear and realistic. It would be impossible for New York's fire department to quell the flames.

The fire department knows that even with enough crew and hoses, the task would be impractical. The plane has destroyed the pipelines in the tower, the sprinkler system isn't working and there is no water for their hoses. Even little efforts aren't possible, like wet towels to put around doors to stop the smoke, as there is no water on the upper floors: nothing to drink, nothing to put out the fire, nothing to keep clothes damp. The upper floors are a dry, crackling death trap.

January Maciejewski, a waiter at Windows on the World, tells his wife in a phone call that he will check the flower vases for water. It will be the last time she hears his voice.

For the fire-fighters on the ground, it becomes harder and harder to calm the increasingly panicked people in the smoky offices. Going up stairs full of people through the blinding smoke and heat – while carrying 50 kilograms of fire equipment – would take hours. The fire-fighters have a hard time believing in miracles. Help is at hand, but not close enough – yet.

In the eyes of the fire-fighters, the trip up the tower is purely a rescue mission with one purpose: to get as many people out of the building as possible.

## The sound of falling bodies

*The heat is now so intense and the smoke so dense that those who are trapped are starting to choose death rather than hope.*

North tower: all around panic reigns: people shouting, walkie-talkies crackling, and ▶

## Terrorists' flights take off near targets

Flight number	Route	Type	Crew	Passengers
American Airlines Flight 11	Boston-Los Angeles	Boeing 767	<b>11</b>	<b>80</b>
United Airlines Flight 175	Boston-Los Angeles	Boeing 767	<b>9</b>	<b>56</b>
United Airlines Flight 93	Newark-San Francisco	Boeing 757	<b>7</b>	<b>37</b>
American Airlines Flight 77	Virginia-Los Angeles	Boeing 757	<b>6</b>	<b>58</b>



**Over 200 people were trapped at the top of the twin towers – many chose to jump to their deaths rather than be engulfed by flames.**

AP/POLFOTO



sirens wailing. The worst of it though, is the thunderous, drum-like sound emanating from the building's roof: it comes from falling bodies. So many people are jumping that the sound is relentless. Rescue leader, Orio Palmer is eventually forced to send a message over the public address system, to all floors in the north tower.

"Please do not jump", he begs, but to no avail. The aircraft has also destroyed the tower's public address system.

Around the north tower, police helicopters swarm and as some of the first on the scene, they finally get an overview. The north tower's upper walls have gaping breaches in them and people are jumping from these holes to their deaths.

In 1980, a fire broke out at the MGM Grand hotel in Las Vegas. There were 87 deaths, but in a heroic rescue, helicopters evacuated nearly 1,000 people from the hotel roof. Here, 21 years later, helicopter pilots have been told not to land on the roof of the World Trade Center – as nobody has an overview of the risk and danger, and no one will give the order. Instead, the pilots witness a mass suicide.

### **South tower is hit**

***09.03: the evacuation of the north tower is in full swing. A message comes over the loudspeaker that the south tower is safe and evacuation can begin. Some leave the tower, but most stay in their offices, convinced that whatever has hit the north tower was an accident.***

South tower: the phone rings in Stanley Praitnath's office, as he enters the room. He picks up the phone and hears a familiar voice. It's a female colleague from Chicago.

"Are you okay?" Asks the woman.

"Yes, I'm fine", he assures her.

"Stan, I'm watching TV. Have you seen the news and know what is going on?"

"Yes", he assures her again, "I'm good".

As he speaks, he turns around in his chair and looks out of the window at the view of New York harbour and the Statue of Liberty. On the water, ferries and yachts cut peacefully through the water, leaving a white wake behind them.

Fleeting, at the edge of his field of vision he notices a strange shape on the horizon. Praitnath turns distractedly toward the object to study it. It looks like a plane and it is heading towards his office; actually directly towards his window. When he sees the letter U on the plane's side, he realises what is about to happen.

"Oh, God", he roars into the phone and dives instinctively under the desk while his colleague in Chicago listens to the telephone and watches the plane crash into the World Trade Center on television. The time is exactly 09.02.59 when United Airlines Flight 175 ploughs through the south tower and into the room where Praitnath hides under his desk. Seconds later, the office turns into a burning ruin. The walls collapse, wires hang from the ceiling, dust fills the room. Praitnath sees that the one of the aircraft's wings has lodged into a door just six metres from his desk. Moments afterwards, the ceiling collapses.

Just before the suicide pilot smashes his deadly weapon into the south tower, he tilts the plane so Flight 175 hits the south tower at an angle to hit as many floors as possible, but the manoeuvre actually save lives. Although the plane rips through several floors, it leaves – unlike in the north tower – a single accessible emergency exit. Even though the stairs are

# ***"Jesus Christ, another***



still intact, it's definitely not a good place to be. It is filled with smoke and in some places, the walls have collapsed.

As Paimnath looks up again over the dust, he sees people, who seconds before, had stood and talked and drawn breath, lying dead: burned or unrecognisable. But miraculously, others like Paimnath are still alive.

A number of the survivors describe how, after impact the tower begins to lean dangerously west towards the Hudson River. On this otherwise calm day, the tilt is so marked that people have to lean against walls and grab the tables to keep their balance. Over the next four minutes, the World Trade Center's 415-metre-high south tower swings dangerously back and forth, until finally it is stable again. Then, there is total darkness.

### Only four escape from the top

**09.04: in the midst of chaos, death and destruction and against all odds, people survive. One of them is the vice-president of brokerage firm, Euro Brokers.**

South tower: moments before the impact, Richard Fern left his desk in the eastern part of the tower where, seconds later, the plane hits and kills everyone. He presses the button for the elevator on the 84th floor, but it doesn't work – this ensures he avoids being trapped in the shaft and certain death.

After being thrown against the wall, Fern finds himself in complete darkness and – by pure chance – next to the only intact escape route in the tower. He treads his way down the stairs, coming across people dragging themselves up and warning him not to continue down the smoky escape route. Fern ignores the

warnings, working his way through the debris of a fallen wall, blocking the stairs and continues through the heat and smoke down nine stairs to the next floor. Down nine stairs to the next floor: down and down and down – a total of 1,512 stairs. Eventually, 20 minutes later, Fern staggers out onto Church Street.

Through a mixture of luck and pigheadedness, Richard Fern is one of only four people who manage to escape from the floors above the impact site. The three other survivors, including Stanley Paimnath, tell the same story: they were warned against continuing downwards. They only survived because they went against the flow.

Others' persistence helped them to survive. Seconds before the first plane hit, six men got into the elevator on the north tower's 44th floor, including John Phoenix, carrying the coffee, milk and pastries he has bought from the cafeteria on the 43rd floor, and January Demczur, a window cleaner, who wanders in with his green bucket and scraper.

The elevator starts to move upwards, but suddenly stops, flinging everyone around the cabin. None of the men know what has happened, but after 10 minutes, dark smoke begins seeping into the cabin. By pushing the handle of Demczur's long window scraper between the elevator doors, they manage to prise them apart and find themselves gazing directly onto a 20-centimetre-thick drywall.

By dipping their clothes in the milk and putting them over their faces, they manage to breathe through the smoke, and with the metal handle from Demczur's tools they manage to hammer through three layers of plaster walls and a layer of tiles before escaping death in the lifts. Others are not so lucky, and in all likelihood,

many would have died, trapped in the lifts without ever knowing what had hit the World Trade Center.

### Steel falls from the sky

**09.08: from the air, helicopters try to evacuate people trapped on the roof of the north tower. But heavy smoke and heat make the mission impossible, and pilots' orders are clear: no one may land on the roof. Instead, the pilots watch the gruesome spectacle of people gasping for breath and waving desperately for help.**

North tower: from the lower floors, evacuation is possible, so people from the upper floors hurry down the stairs in two lines. When the old and wounded arrive, carried by colleagues, friends or strangers, people quickly move aside and the two lines temporarily merge into one.

In the windowless stairwells, people have no idea about what has happened. The thousands who reach the lobby of the World Trade Center and onto the street are stuck by shock. They walk out to see what looks like a devastated lunar surface. As a result of falling steel and cement, the ground is full of holes, dusty and deserted. Bodies are lying on the ground along with shoes, aircraft parts, luggage, a window covered in blood and pieces of clothing – the only visible remains of people from the upper floors. Officers on the street can clearly read the panic in the faces of the evacuees.

"Continue. Keep moving. Don't look up", is the order to keep the evacuation flowing and spare people from seeing the worst of what's happening around them. Pieces of steel the size of fridges are raining from the sky, heading ►

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# there is plane coming!"

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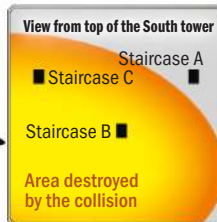


# 2,200 people were trapped

Hundreds of Americans who worked in the World Trade Center were killed when a plane exploded where they worked. Even more were trapped on higher floors where a mix of misinformation and shattered exits sentenced them to death.

FLIGHT 175 comes from the water, passing the Statue of Liberty and hitting the 78th-83rd floors of the south tower.

CLAUS LUNAU/HISTORIE



**THE SOUTH TOWER** is hit at an angle, so fuel and debris only falls on one side of the building, leaving some stair exits intact. Survivors of the aircraft collision escape with minor injuries, and people from the upper floors are able to reach safety.

The landing gear from Flight 11 smashes its way through the north tower, landing at a crossroad four streets away.

An elevator was repaired by fire-fighters so evacuees could escape from the 41st floor.

The roof door is locked, so no one can get onto the helicopter from the roof.

Fuji Bank employees ran for safety, when the north tower was hit, but many returned.

## Steel structures distorted in the extreme heat

Aviation fuel starts fires, which in turn cause the temperature in the twin towers to reach extreme levels. The steel columns, weakened by the intense temperatures, begin to disintegrate and eventually collapse.

### TEMPERATURE STEEL'S STRENGTH

500 °C

75 %

750 °C

15 %

1,000 °C

5 %



The twin towers' heat-weakened steel could not hold the buildings up any longer.

The Marriott Hotel teams with rescuers as the towers collapse.

Flames from jet fuel billow from the 78th floor, via elevator shafts, down to the lobby.

About 12,000 of the people in the World Trade Center escape before the two towers collapse.

GETTY IMAGES



**TV signals** are lost across the city. Screens go black when the tower collapses.

**1,350 people** are trapped 400 metres above the ground.

**FLIGHT 11** flies low over New York from the north and rams into the north tower between the 94th-98th floors.

**THE NORTH TOWER** is hit near the top. There were few elevators in the middle of the tower, so stairs were critical for escape. All three staircases were destroyed when the plane ploughed through the building.

View from top of the North tower

Staircase C ■  
Staircase B ■ Area damaged by the collision  
Staircase A ■



**All 300 employees** from the firm Marsh & McLennan die, when the plane hits their offices.

**16 people survive** on a staircase that miraculously remains intact after the north tower collapses.

**Life jackets and plane seats** land on World Trade Center 5.

**It is too dangerous** for people to use the towers' entrances, so they flee through an underground shopping centre instead.

**Burning rubble** from the north tower sets fire to World Trade Center 7.

**An engine** from Flight 175 lands three streets away.

### **1** The south tower falls first

Only a few steel columns remain and, weakened by the heat, the building collapses at **09.59**.



### **2** The north tower hits the ground

The tower stays standing as long as possible, but eventually crumbles under its own weight at **10.28**.



### **3** The Marriott Hotel buried in debris

The south tower's collapse splits the hotel in half. The north tower's fall left a tiny corner intact.



### **4** Fire engulfs World Trade Center 7

The Twin Towers' little brother catches fire from the north tower. It collapses at **17.20**.



**Fragments of landing gear** were found in an alley in 2013.



relentlessly towards the ground: even here it's not safe.

Fire-fighters guide people across the inferno onto the square in Church Street. Many of those who escape seek shelter behind the cast iron gates of the nearby church, where a priest meets them and pulls them to safety.

## The emergency exit is locked

**09.42: while thousands escape via stairs, the evacuation from the air is nonexistent. Nearly half a kilometre above street level, pilots assess that they badly need someone to intervene. The fire has spread in both towers.**

South tower: after a long walk through the smoke and dust, a group of about 200 people reach the south tower's roof on the 105th floor, but the door to the roof is locked. They're desperately trying to get through, but their effort is futile: the door can't be opened.

On the stairs, a few metres from the roof, rescue personnel and their families begin to receive emergency calls. One tells his wife about the situation, and knows that help is on the way and that they must keep going. The message to the control centre is: "Two World Trade towers, 105 floors. People are trapped. Open the roof door to provide access".

About the same time, helicopter pilots get a single message: "Prepare your

helicopters. We need you on the roof", an officer reports.

The pilot has just received the message when he sees more people jumping from the building. "Get on the roof", he feels like shouting as he flies closer.

But the door cannot be opened. People are trapped.

But moments later, to the pilot's frustration, he's given a counter-order:

"Be aware that nobody should go to the top of the building, no one may go to the top of the building", says the message.

The northwest corner of the north tower is still reasonably clear of smoke, reports a pilot, but the pilot can't land his helicopter as the World Trade Center's automatic window washer blocks the only spot where he could land.

The only option left is to lower the helicopter's hoist and hopefully save a few people from the roof; an effort that will require patience, as he will only be able to take two people at a time. And as well as the obvious panic, it's a tricky manoeuvre. The hoisting cable could get stuck to the roof's antennas, immobilising the helicopter completely.

It could be disastrous and he's aware that he has a difficult choice to make between his own life and the lives of the people on the roof.

## The building's structure melts

**09.57: a few years earlier, the facilities manager for the World**

**Trade Center proudly claimed that "not even a passenger plane" could topple the building. Therefore, no one can imagine what's about to happen.**

North tower: sirens from fire engines, ambulances and police cars create a deafening cacophony, so much so that it's hard to make oneself heard. One of the World Trade Center's building inspectors, Gerry Drohan, stands on the sidewalk with a walkie-talkie pressed against his ear, trying to hear what the people in the tower are saying. Suddenly he hears a nasal voice that he immediately recognises as Frank De Martini – a building technician – who is still on one of the top floors.

Despite the seriousness of the situation De Martini is calm and collected. He says that he has seen something in the building's steel structure that he doesn't like. Drohan doesn't quite understand what he means, but if De Martini is nervous, it must be serious. After all, this is the man who in January 2001 said, in a TV interview on the History Channel, that not even a Boeing 707 could topple the World Trade Center.

Up in the towers, evacuation is almost complete. More than 10,000 people are rescued safely. So when firemen fight their way up to the empty floors examining them one by one, they only find only a few remaining: disabled people in wheelchairs who cannot escape because the elevators don't work, people who were in the elevators, the old, the deaf and asthma sufferers who cannot move quickly enough to escape.

No one imagines that the buildings will collapse and firemen in the building decide that there are many more people to be saved on the burning floors, higher up.

And so the firemen continue upward. People notice the exhaustion in their faces as they carry many kilograms of equipment in the intense heat. It's so intense that people are throwing off their clothes, while the fire-fighters continue battling upwards, dressed in thick, protective clothing.

Dehydrated and dizzy, they take a rest on the 22nd floor – where they hit a metaphorical wall. Fireman Michael Otten is one of the crew on his way up the south tower, moving up into an unknown hell, while his brother-in-law, a stockbroker with the same name, Michael Otten, moves down. ►



**Around 2,200 employees were stuck in the World Trade Center. Up to 12,000 others escaped down the long stairs and out onto the street, before the towers collapsed.**



# US military should be punished

The terrorists wanted to harm the US Department of Defense's Pentagon building.

The Pentagon was seen as a symbol of the US's military involvement in the Middle East.

**A**t 09.34, Air Defence warned the White House that an aircraft was approaching the presidential residence. George Bush was in Florida, but security officials immediately took Vice President Dick Cheney to safety in an underground bunker.

Then, instead of keeping its course, American Airlines Flight 77 suddenly changed direction. The terrorist behind the controls swung the plane south towards the Pentagon, gave the engine full throttle and dived towards the ground at 850 km/h. At 09.37 it tore down five lampposts, the right wing destroyed a parked mobile generator and Flight 77 crashed straight into the western side of the Pentagon.

The Pentagon huge complex spans five floors, so it was impossible for the terrorists to destroy it like they had the World Trade Center's twin towers. Only 125 of the 18,000 people who had come to work that day died alongside the 53 passengers, six crew members and five hijackers of Flight 77.



CLAUS LUNAU/HISTORIE

**FLIGHT 77** landed on a street near the Pentagon's grounds on its way to the US's military heart.



**When Flight 77 struck, debris ended up on the lawn in front of the Pentagon.**

AP/POLFOFO





***“The north tower is leaning and it is falling at its southwest corner”.***

The warning from a police helicopter

***A thick cloud of dust spread over Manhattan when the twin towers fell.***

AP/POLFO



Perhaps the two men's paths cross, they would never know – they do not see each other then or ever again. The firefighter dies, but the stockbroker escapes with his life.

## Many say goodbye

***People are beginning to realise the inevitable. The telephone network is overloaded with calls from mobile phones, breaking up the signal and ensuring their final testimony is an answer phone message picked up by relatives – much later on.***

South tower: no phone calls can describe the horror on top of the twin towers on 11th September, 2001. Most calls were marked by desperation and cries for help, but hundreds of others served as a last farewell.

The 37-year-old stockbroker Brad Vadas leaves such a message on his fiancée's voicemail:

"Kris, there has been an explosion. We're trapped. Smoke is everywhere. I want you to know that my life has been so much better and richer with you in it. I love you."

Also, Ed McNally calls his wife from the 97th floor. He has something to say. She and the kids mean everything to him. The insurance papers are in a file on his computer. Other important documents are in another file. After saying goodbye, McNally calls back a few minutes later. He had planned a surprise for his wife's 40th birthday.

"I feel stupid", he says, "I have booked a trip to Rome. Liz, try to cancel it."

His wife tries to lift his spirits, filling him with hope: "Ed", she says, "you're

going to escape. Fire-fighters are on their way to get you out".

Sadly, about the same time the fire chiefs come to the opposite conclusion, that people like Vadas and McNally are lost. They cannot be saved: a decision servicemen intend to disprove.

In the south tower, Fire Chief Orio J Palmer has found a working elevator, which can take him to the 40th floor. He takes his radio as it is finally working, and sends a message to his superiors on the ground.

"This is Battalion 7 on the 40th floor", he says, having single-handedly rigged the elevator to get close to the fire.

"We've got a lift to work", he continues, as he heads towards the fire. On the way up, he moves onto the stairs where the heat becomes more intense, but as a former marathon runner, Palmer moves at an incredible speed. Palmer and his team move onto the 78th floor of the south tower. Rescue personnel are on the way to tackle the flames.

From the 78th floor, Palmer reports back to the command station in the tower's lobby. When finally, after some communication problems he makes contact, his boss notes that his voice has a slightly higher tone than usual. But otherwise, his voice is surprisingly calm for a man who has shot up the stairs and into an inferno of flames. Palmer is now on the 78th floor.

"We have two isolated pockets of fire", Palmer reports, "we should be able to put them out with two hoses".

The next part of the message stutters, slowly – perhaps due to exhaustion, or maybe because of the sight that faces him next:

"Tell, tell, tell them that the 78th floor... Several 10-45, Code 1".

The fire department avoids using the term "civilian", referring to them as "10-45s". Fire-fighters do not say "dead" but "Code 1".

"On the 78th floor?" asks the man at the other end.

"10-4", Palmer replies, "several civilians. We need two hoses".

"We are on the way", is the answer.

Minutes after, Palmer receives another message. He is in full swing, helping the injured on the 78th floor when he suddenly hears a message from the unit on the radio "Ladder 15".

"Trapped in the elevator. We'll cut our way through the wall, so we can get out".

There's a minute's silence on the line, until Palmer starts to speak.

"7 Battalion to Ladder 15..." It will be his last words.

## Last words from south tower

***09.59: on the ground, rescue personnel receive a call, nearly 50 minutes after the plane hit the south tower. The caller, Thorpe, says that people around him on the 89th floor have passed out from lack of oxygen, and that he's going to break the windows. It is the last thing anyone ever hears from the 89th floor.***

South tower: about this time, one of the building engineers makes an ominous call to one of the heads of the New York Fire Department. As the smoke clears he gets a glimpse of the building. He can see damage to the tower and aluminium floating down the side of the building. ▶

## Nine days later the US declared war

On 11th September, 2001, there were 2,996 victims of the most violent attack on the US since the civil war. Therefore, President George W Bush was visibly shaken when he received the news of the attack on the twin towers during a visit to a school in Florida. When, nine days later he took the floor in Congress, it was with the message that, "From today, any nation that protects terrorists, will be considered a hostile nation". 17 days later, a coalition led by the US invaded Afghanistan to find Osama bin Laden and wipe out al-Qaeda.

***President Bush was visiting a school when he heard the news of the horrors in New York.***



# 5 things that hampered the fire-fighters

**1** Fire-fighters believed they had plenty of time to complete the rescue as the towers weren't thought to be structurally vulnerable.

**2** Fire-fighters dragged their heavy hoses and equipment into the building with them and ended up exhausted on the stairs.

**3** The fire department didn't have helicopters, and fire chiefs weren't able to see the impact of the fire within the towers.

**4** Radio equipment was old and fire-fighters in the towers lost contact. They didn't hear warnings threatening the collapse.

**5** The day shift was replacing the night shift when the alarm went off. When fire trucks arrived, there were people everywhere as the building sank into the ground.

343 fire-fighters died when the World Trade Center collapsed.

GETTY IMAGES



The stability of both buildings is at risk. He cannot guess how long they will remain standing.

The 83rd floor has already collapsed into the 82nd floor, photographs will later reveal. In phone calls from the tower, those trapped on the 105th floor say that the same has happened with floor 106.

Nobody believes this could happen. Engineers are at a loss. Just as it was said that the Titanic was unsinkable, people have similarly said that the World Trade Center can survive an aircraft collision. And just as the Titanic was proved sinkable, the twin towers, like all other buildings, could collapse; and were in immediate danger of doing so.

Meanwhile helicopter pilots are still considering how to rescue people from the north tower, and now they

have the scary prospect of what is now happening to the opposite tower.

In less than 10 seconds, the south tower collapses in front of their eyes. The floors collapse and fall like pistons one on top of the other with greater and greater force, eventually hitting the ground to disintegrate into a cloud of dust and construction debris, which crashes into the basement of the north tower before rising up through the stairwells and lift shafts, spreading dust, smoke and ash into the air.

For 28 years, in all weathers, the World Trade Center's twin towers loomed over Manhattan: two bold parallel lines. Now in less than 10 seconds the south tower has disappeared from the skyline. People in the north tower, oblivious to what's happening, think bombs are exploding. The force is so strong that the energy released is equivalent to five per cent of Hiroshima's atomic bomb – that's enough energy to keep the metropolis of Miami

in electricity for an hour. More than 400 kilometres away, seismographs shudder. The entire area around the World Trade Center shakes from the pressure from the collapsing tower, pulling more people to their death from the still-occupied floors, the lobby and outside on the streets surrounding the building.

## Full evacuation begins

*Following the collapse of the south tower, the fire department order everyone out of the north tower. But communication lines are overloaded, and not everyone gets the message.*

North tower: after a long and difficult journey from the 89th floor Dianne DeFontes, who an hour earlier sat and drank coffee, took phone calls and ate yogurt, succeeds in escaping the north tower. Out on the street, she heads north. She sees herself in a shop window in Greenwich Village and thinks:

"I'm black and my face is completely white. My hair is completely white. I cannot believe that this is me".

At time ticks on, yet another ominous message is sent to the helicopter pilots, only half an hour after the south tower collapsed:

"Please note that I'm not 100 per cent sure, but it looks as if the top of the tower is leaning".

"Leaning tower?" asks the operator.

"It is confirmed, the tower is leaning southwards".

"Which tower is it?" asks the operator. "One or two?"

"It's the one that's left", replies the pilot. "North tower is leaning at its southwest corner, right now It seems to be bending at its southwest corner".

The rescue operation at the World Trade Center was the bloodiest in the New York Fire Department's history.

GETTY IMAGES





The receiver repeats the message:

"North tower is leaning", he says. "And it seems to be leaning right now, in the southwest corner".

## North tower crumbles

**102 minutes after a passenger plane hit, the north tower's fragile steel skeleton collapses, as the weight from the crumbling floors is too much too bear.**

**Disaster is inevitable.**

North tower: at 10.28, the north tower begins to move. Observers describe how the tower starts to sway. A few seconds later, people realise that today they will witness both towers' disappearance from the Manhattan skyline.

A cloud of dust and smoke shoots up from the north tower's upper floors and pours from the building before it finally hits the ground. The north tower has collapsed. It's been 102 minutes since the plane hit. In just under two hours, the world has irreversibly changed.

### ABOUT THE ARTICLE:

*We have deliberately not dealt with conspiracy theories in this special issue – out of respect for the dead and their survivors. There is no doubt what caused the towers' collapse – from Osama bin Laden's terrorist cells' long-standing and targeted training on the United States to eyewitness reports from the Pentagon and the towers, along with subsequent analysis from eminent experts. The attack had a mastermind with a motive and a purpose.*

*Still, it is almost impossible to imagine that a single passenger can bring down a plane. But bin Laden's henchmen had flown the bomb with tremendous force into a man-made construction of steel girders and cement. Only those who saw the attack could understand the forces that were unleashed by the collision: a force that made the earth tremble, the towers sway and ceilings and walls to collapse, sending fireballs 300 metres down into the lobby and crushing marble walls. Eyewitnesses experienced the damage caused from the thousands of tons of jet fuel, how it set surrounding buildings on fire, and the effect it had on the buildings' structural steel frames.*

### POSTSCRIPT:

*The attacks on 11th September cost nearly 3,000 peoples' lives – more ►*

# Passengers fought back on the way to Washington

**Surprise was the key to al-Qaeda's hijacking plans. Yet onboard Flight 93 four hijackers waited before attempting to seize control.**

Everything started to go wrong the moment the four al-Qaeda hijackers boarded United Airlines Flight 93 from New Jersey to San Francisco. Heavy airport congestion meant it departed 42 minutes late, just four minutes before Flight 11 ploughed into the north tower of the World Trade Center. Despite the

delay, the hijackers didn't act until 45 minutes into the flight, by which time Flight 93 was several hundred kilometres into its journey. This left them with a long route back towards Washington and their intended target, believed to be the White House or Congress on Capitol Hill.

United Airlines Flight 93 was photographed for the last time on 8th September, 2001.



## The hijackers reveal themselves

Four hijackers storm the cockpit at 09.28, but when the pilot sends the distress signal, he also sets the intercom to the cabin, so messages are sent from the passengers in the cabin too. Therefore, air traffic control can eavesdrop on the terrorists as they give instructions in broken English: "Ladies and gentlemen, here is... Captain. Please be seated... Stay seated. We have a bomb on board. So sit". Meanwhile the plane turns around and the terrorists head for the US capital.

## Fighters take flight

Around 09.45 two F-16s take off from a military base to intercept Flight 93 before the plane reaches the capital. Fighters are armed with a small amount of ammunition, and the two pilots agree to ram the passenger aircraft's cockpit and tail, if all else fails. The pilots know that they are unlikely to have time to eject in the clash.



Pilots from the National Guard took off from Washington to stop Flight 93.

## Rebellion stops terrorism

Passengers have heard about the attacks on the World Trade Center. They start a counter-action to take back control of the plane. The terrorists realise they've lost control and the plane heads for the ground.



The terrorist action ended on a green field in Pennsylvania.



*lives than were lost in the Japanese attack on Pearl Harbor in 1941. This made it the deadliest attack on American soil since the Civil War, 140 years previously. So, it was not without reason that Americans perceived the*

*terrorist attack as a declaration of war and this matched Osama bin Laden's intentions. For years he had tried to pull the United States into a war to strengthen the legitimacy of his jihadist movement. But it wasn't*

*until he brought the war to American soil that the superpower responded. The attack changed the world, leaving deep scars into the new millennium. In the hunt for bin Laden and especially al-Qaeda's training camps,*



**A dense layer of dust covered everything near the World Trade Center on 11th September.**

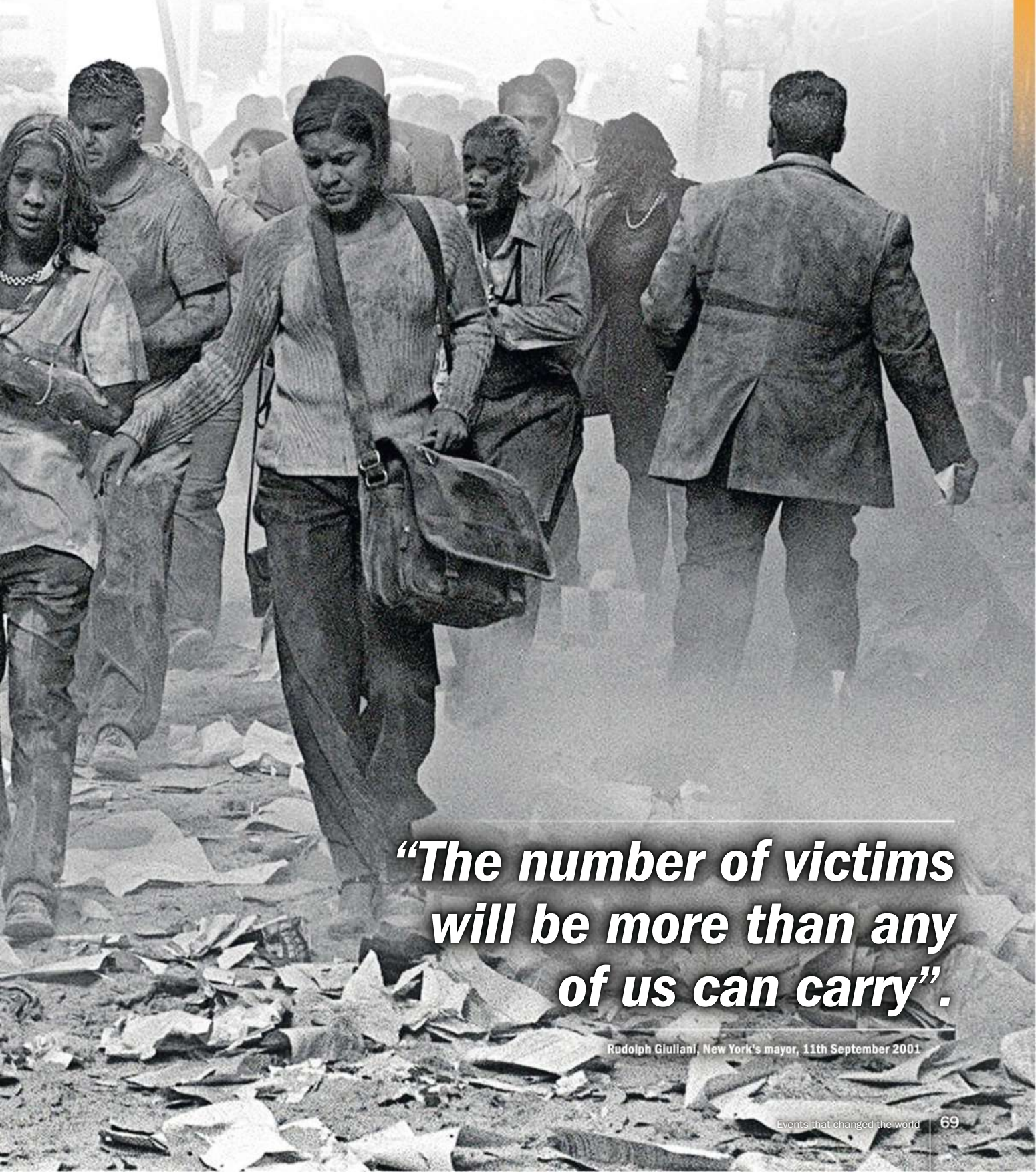
AP / POLFOTO



*war was declared on the Taliban movement in Afghanistan. Here, 15 years later there is still no peace in the mountainous nation, which became the jihadists' favourite fighting ground. Since then, the focus shifted*

*to Iraq, where spurned officers from Saddam Hussein's army entered a fatal alliance with religious zealots. The result was a bloody civil war and thousands of highly trained jihadists have since shaped*

*what we know as the Islamic State. Bin Laden's heirs have more power than any Arab prince ever did, and his sinister legacy lives on, even though he himself was captured and killed on 2nd May, 2011.*



***“The number of victims  
will be more than any  
of us can carry”.***

Rudolph Giuliani, New York's mayor, 11th September 2001





The German Embassy's newspaper advert warned of possible attacks.



People flocked to experience a voyage on the 240-metre-long Lusitania; not even the threat of a submarine attack could curb peoples' interest in the magnificent ship.

# German submarine kills 1,200 civilians

*Despite the Great War, luxury liners continued cruising. The queen of the sea was the Lusitania. In May 1915, a German submarine had the British ship in its sights. With a single torpedo it sank the Lusitania – an act that eventually drew the United States into the war.*

BY ELSE CHRISTENSEN  
In the U20's command room it was quiet. For a moment, the submariners forgot how long they had been submerged. Everyone's attention was on Captain Schwieger as he stared intently into the periscope.

"Four chimneys, schooner rigged, over 20,000 tons and a speed of approximately 22 knots", he noted. The silhouette belonged to one of the world's largest steamers and the sight of the great ship was almost too good to be true. Schwieger gave the order to make the torpedoes ready.

## High speed and wild luxury

With its top speed of 25 knots, the Lusitania was among the fastest steamers on the Atlantic. The press

called the ship "a marvel of speed and luxury" with its opulent cabins and lounges. Every departure was like a big party as the rich and famous flocked to experience the ship.

The departure from New York on 1st May, 1915 – Lusitania's 202nd trip across the Atlantic – was not so different. There were fewer passengers than usual because of the war in Europe, but Captain William Turner assured everyone that everything was fine.

Although the captain was calm, he had an air of caution. He was troubled by a newspaper advert put out by the German Embassy in Washington and strategically placed just below the shipping company Cunard's advert, encouraging travel to Europe. The





### LUSITANIA SANK HERE

The Lusitania was torpedoed close to its destination of Liverpool.



ULLSTEIN BILD

## WAR from A-Z

### Zimmermann Telegram:

In January 1917, the British decoded a telegram from German Foreign Minister Arthur Zimmermann. It proposed a military alliance between Germany and Mexico in the event of the United States' entering WWI against Germany.

Germans' advert was a warning to "travellers who planned to cross the Atlantic" that suggested that passengers on Allied ships travelled at their own risk. The words were a grim reminder of the war in Europe. England had launched a naval blockade of Germany, and Germany responded by sending its submarines out to sink British merchant ships. The advert was an obvious warning to the Lusitania.

The first five days of the trip were normal, but on 6th May, as the Lusitania approached Ireland a telegram arrived: "Submarine activity off the south coast of Ireland". Lights were turned off, doors shut and lifeboats prepared.

The next day, several disturbing messages arrived. A German submarine was on the same course as the Lusitania. So, at 12.15, Turner changed route.

### Wrong information gave false hope

Another telegram arrived 15 minutes later, saying a German submarine had been seen at Cape Clear, a way behind the Lusitania, and Turner breathed a sigh of relief. He had no idea the new information was false. In fact, his change of direction had brought the Lusitania closer to the U20 and into Walther Schwieger's sights.

"A moment later I heard a bang on board the steamship and then a huge explosion". From his post at the periscope, Schwieger wondered how a single torpedo could cause so much damage: "The structure where the torpedo hit, was torn to pieces; a fire broke out and the whole bridge was shrouded in smoke", he wrote in his diary. He thought that a boiler may have caused the massive explosion.

On the Lusitania's bridge, chaos ensued. It was 14.10. A minute later,

the steamer issued an SOS. Turner ordered passengers into the lifeboats.

After the Titanic's disaster, new regulations stated that there should be enough lifeboats for all passengers. But because the ship was listing, the lifeboats swung towards the decks, the heavy vessels sliding across them when nervous passengers jumped on board. Other boats were put into the water so hastily that they sank. Only six of the total of 48 lifeboats launched safely.

### The disaster sent the US into war

Only 18 minutes after the hit, the Lusitania sank with only 700 survivors. Among the 1,201 people dead were 128 Americans, sparking an outcry in the United States.

President Wilson raged against the assault on "the sacred freedom of the sea" and newspapers made the Germans out to be bloodthirsty monsters. The attack rocked America's neutral position surrounding events in

Europe, and although the United States didn't enter the war until April 1917, the loss of American lives on the Lusitania was a major reason for their involvement.

The Lusitania was not completely without fault. Even though the steamer was a civilian passenger ship, it was transporting "special items" for the British Army – including ammunition. Historians suggest that the Lusitania was carrying explosives, which may explain why the ship sank so quickly.

From 1968, the wreck was owned by wealthy Gregg Bemis, and he has finally been given the legal go-ahead to explore its wreckage. He is planning an expedition which may help to shed new light on the incident.

### FURTHER READING

• Mitch Peeke, Steven Jones & Kevin Walsh-Johnson: *The Lusitania Story*, Naval Institute Press, 2002 • Robert D. Ballard: *Exploring the Lusitania*, Weidenfeld and Nicolson, 1995 • Des Hickey & Gus Smith: *Seven Days to Disaster*, Collins, 1981

## U20 ran aground off the coast of Jutland

After the sinking of the Lusitania, the U20's captain Walther Schwieger was put on the British list of war criminals. Schwieger continued his attacks and among them was the attack on the Canadian steamer *RMS Hesperian*. On 4th November,

1916 things went wrong. The U20 ran aground off the coast of Jutland and the crew blew her up so that she couldn't fall into enemy hands. Schwieger died on 5th September, 1917, when his new submarine, the U88, collided with a mine.



The U20 was stranded off the west coast of Jutland.

GEORGE BAIN COLLECTION/ULLSTEIN BILD

### WALTHER SCHWIEGER





**3RD SEPTEMBER 1929**  
Dow Jones' stock index: 380  
Shares on the New York Stock  
Exchange set a new record.

# ALL IS LOST

*USA loses billions in one day*

## WALL STREET, NEW YORK/1929



The US celebrates throughout "The Roaring Twenties". Consumption is high, the mood is elated – and money flows into the New York Stock Exchange with no effort at all. Politicians and economists agree that the US is a society where "everyone can be rich".

*For years, prices on the stock exchange on Wall Street have only known one direction: up. But on 29th October 1929, the party ends abruptly. Share prices plummet, no one will buy, fortunes disappear into thin air and for many years the whole world will be marked by economic depression with high levels of unemployment and deep poverty.*





**29TH OCTOBER 1929**

Dow Jones' stock index: 230

Black Tuesday. The mood on the stock market has been nervous for several weeks before brokers drop 1.5 million shares into the market.

Concerned shareholders and small investors gather around the stock exchange in New York to hear the news. Behind the heavy door prices crash.

GETTY IMAGES

BY ERIK BORK

**I**n the spring of 1929, the mood is euphoric among millions of Americans. From the cafés, new jazz rhythms flow and the streets are teeming with modern cars.

Unemployment is low, and the newly appointed President Herbert Hoover is full of optimism. In his inaugural address to the people he describes the United States as a "new civilisation that is admired by the whole world", and he is sure that individual freedom will make the country invincible.

At the centre of the optimism is the New York Stock Exchange. This creates new wealth

every day from 10-15 stock exchange floors where busy traders send the latest share prices to the whole country. Mostly, the price goes up, up and up again. Since 1921, the Dow Jones' stock index has risen almost six-fold, and companies like Radio Corporation have seen their value rise from \$1.50 to \$114 per share. "Anyone can get rich" is the word on the street and most look with disgust back to the days when wealth was only attainable for the few.

The shares are bought with great appetite by the ordinary wage earners and everyone – from mechanics to waitresses – talks about ▶

**11th JULY 1932**

Dow Jones: 41

Shares hit rock bottom. It will take 25 years before prices reach 1929 levels again.





**For stockbrokers on Wall Street every day was an intoxicating celebration. Revenues set a record, and prices rose.**

POLFO/ORBIS

dividends and potential for new investment on the Dow Jones. Few have financial insight.

**New York, May 1929. *The first signs of an uncertain stock market begins in the early spring, but the warnings are ignored. Traders are planning new investments for the next decade.***

"Cheers to the past – and never let it happen again!" With their usual toast, James Riordan and John Raskob raise their cocktail glasses and take a sip of their dry martini.

The two businessmen are sitting reclined in Raskob's fashionable apartment at Charlton House in the heart of New York. Judging by their impeccable suits and grand manners, it's not obvious that they both grew up in ordinary circumstances. Hard work, influential friends and a high level of risk on the stock market has brought them to rank alongside the most influential men in the US. It's especially true of Raskob, who has developed a great reputation after his time working as Vice President of the automotive group General Motors.

"It will be interesting to follow the Bank of America, now they have bought Nassau National Bank", James Riordan quips before complimenting the excellent martini.

It was Raskob who first introduced Riordan to stock speculation:

"The money will work for you, not vice versa", he explained and then helped his good friend to make his first \$58,000 on the stock market. Since then, the money has grown and James Riordan has been the director of a New

York bank, advising clients on share speculation. Suddenly, Raskob leaps up to fetch a bottle of champagne. He pours it into two glasses and moves over to an object covered by a cloth.

"Now you see", he says, and gently lifts the cloth. Beneath it is a miniature model of a grand building: a tower with hundreds of windows reaching up towards the sky.

"The Empire State Building", whispers Raskob solemnly. "... The future symbol of the American dream, where even the poor can seize some luck on Wall Street".

Riordan listens enthralled and together they study the fascinating model that will be financed by the stock market.

**New York, June 1929. *Irving Berlin's song "Blue skies smilin' at me" has become a hit in the United States.***

Laughter washes across the stage where the comedian Groucho Marx plays the crazy explorer Geoffrey Spaulding in the stage adaptation of "Animal Crackers" on Broadway.

"One morning I shot an elephant in my pyjamas. How he got in my pyjamas, I will never know", says Groucho.

With a few successful roles under his belt, the young actor is at the peak of his career and his sharp one-liners are a perfect fit for the current mood in New York: fun and games.

After the curtain falls, Groucho enjoys the good life. He puts lump sums of his salary into shares that seem to rocket upwards continuously. When the sun shines, the young comedian struts around the golf course with a Havana cigar hanging from the corner of his mouth. To friends and acquaintances, Groucho admits that he has no idea how shares work, but trusts his tips and – so far – it's gone well for him.

Groucho's debut as a speculator happened one day in 1926, in the elevator at the Copley Plaza Hotel in Boston on a visit to his brother Harpo. The elevator operator recognised him and gave him an immediate tip:

"You know what, Mr Marx? There were two guys in here a little while ago: really big guns in double-breasted suits. I heard one guy say to the other, that he should put all his money in the United Corporation".

Groucho ran the last stretch to Harpo's room, then the two brothers stormed – Harpo, wearing only a bathrobe – back to the elevator and down to the broker's office, where together they bought United Corporation for \$160, 000.

**New York, 17th July 1929. *The Dow Jones' index shows 344. The air is thick with stock market tips.***

If anyone knows the market, it is Pat Bologna – the small, stocky man stands outside 60 Wall



Street every day. Bologna has shined shoes for years, and among his customers are America's richest men and largest financial jugglers who always have a chat about shares as they get their shoes shined.

Today it's Joe Kennedy – father of future President John F. Kennedy – who wants his shoes cleaned.

"How's the market, Pat?"

"It is booming, Mr K, just booming!"

"So you make big money?"

"Definitely. Will you ha' good advice?"

Joe Kennedy smiles and nods.

"Buy oil and railway shares", says Pat Bologna. "They hit the sky. I had a guy today with insider knowledge."

Kennedy throws him a quarter and thanks him for the tip. Even Pat Bologna buys shares and things are going well. Very well.

**New York, August 1929. During the summer over \$7 billion has been lent to investors through market makers.**

Since the beginning of the year more than 200 new investment trusts have been created,

giving everyone free access to the stock market. But how does an ordinary mechanic with \$100 in his pocket get rich in the stock market? The answer is simple: through bank loans.

With \$100 as security, he can borrow \$900 from the bank. Now he has \$1,000, which he puts down as an investment. This company goes to the bank to take out a loan too, and so the mechanic's original \$100 increases to \$10,000 – and with the share performance on Wall Street responding, it cannot go wrong.

It is no longer only men who speculate on the exchange. An article in the magazine *North American Review* says that women have become major players in "man's most exciting, capitalist game". In a suite at the Waldorf Astoria Hotel, a group of women get together every day to discuss their share purchases.

**New York, 5th September 1929, 12.30.**

***New York is caught up in a late heat wave, suggesting a calm autumn. The Dow Jones' index has crept up to 379.***

The alarm suddenly starts ringing at the United Press news agency: "ECONOMIST PREDICTS EQUITY CRASH".

The message is coming from Boston, where the economist Roger W Babson has just spoken at a financial conference. Shortly afterwards, United Press sends a telegraph to the country's newspapers with a more detailed news' story:

"Sooner or later the market will collapse, and it will be terrible. Factories will close. People will lose their jobs. The vicious circle will rotate in earnest, resulting in a severe depression", the agency writes.

**New York, a few hours later.**

***United Press sends Babson's prediction to US newspapers.***

Financier John Raskob has just stepped out of his office on Park Avenue when he catches sight of the afternoon newspaper headlines. They tell of Babson's dire prediction.

Raskob turns around and heads back to his office. Stock prices are suddenly in free fall, and upset, he calls his business associates.

"Bad news", snorts his friend James Riordan, and together see that the stock index closes at 369 – a drop of 10 points.

**Yale University, 15th October 1929. The stock market has recovered, but it is still unstable. Dow Jones: 351.**

Professor Irving Fisher of Yale ▶



**The Roaring Twenties** was under way. Americans cultivated the Charleston, a new dance that was considered both daring and provocative.

POLFO/ORBIS

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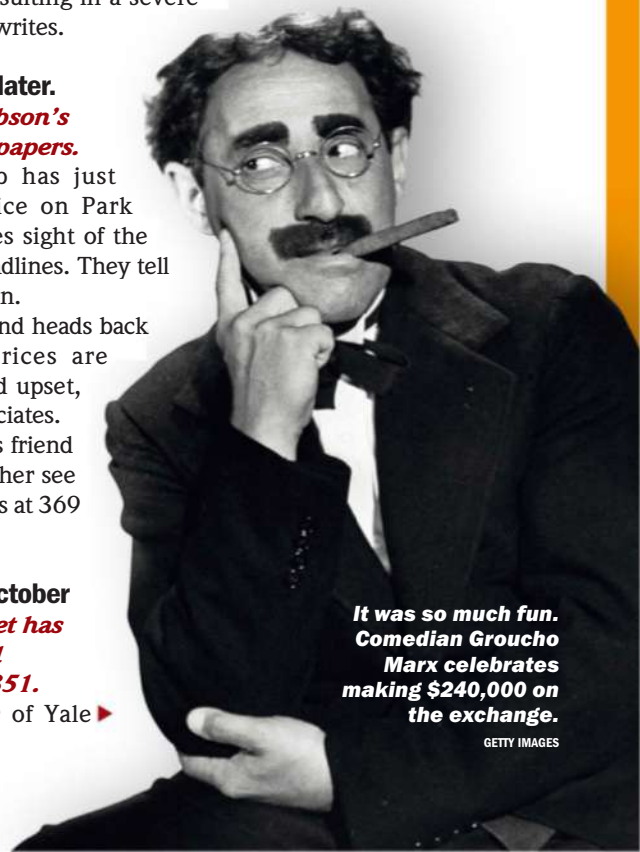


**The exchange telegraph brought the latest rates to the country.**

## The latest news from Wall Street

The pulse on the New York Stock Exchange began to turn as the stock exchange telegraph was presented in 1867. Before that time stock trades were a tedious affair – now current rates could be sent out to brokers across the country. A simple precursor to the telex machine printed long strips of paper with all the shares.

15 years later, three American journalists opened a news service that kept an eye on the leading shares. In this way, it was possible to build the business model in the country. Dow Jones' stock market index still exists today, while only one of the 12 companies in the original index has survived: General Electric.



**It was so much fun. Comedian Groucho Marx celebrates making \$240,000 on the exchange.**

GETTY IMAGES



University is irritated. Journalists from across the United States are calling him daily. Fisher has developed an economic theory, which describes the relationship between currency, stock and prices. Despite the turmoil in the stock market, Fisher is quite convinced that the market is healthy, and he makes every effort to refute his colleague from Boston.

“Stock prices have reached what looks like a permanently high level”, Fisher explains in a calm manner. “Within a few months, I expect to see a stock market that is somewhat higher than today”.

The same day, Fisher was backed by the Director of National City Bank Charles Mitchell, whose nickname was “Sunshine Charley”. “The stock market is healthy”, he says firmly.

**Wall Street, 24th October 1929. The day before, share-dealing reached over six million shares – the second highest number in the exchange's history.**

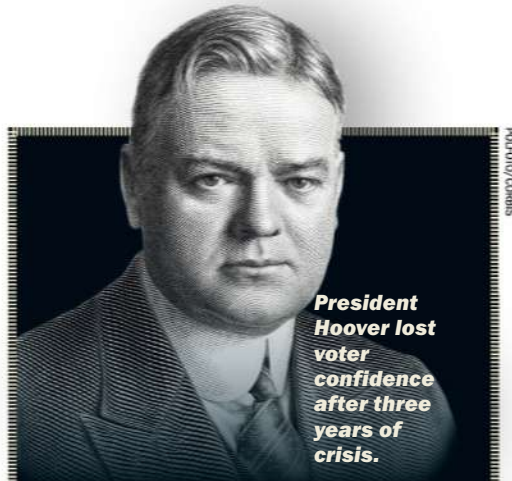
All eyes follow nervous stock exchange Inspector William Crawford as he wanders the exchange's floor at slightly after 10 am. Crawford would open the trade floor by sounding the exchange's big bell – a task he usually performed with a smile. Today, the mood was nervous. At the numerous horseshoe-shaped tables, brokers are quiet, and there are far more people than usual gathered on the 1,400 m<sup>2</sup> floor.

At the podium, Crawford gives the bell an extra strike to try to lift the mood.

A thundering sound comes from the floor as trade for the day gets underway. In the first minutes, shares from Kennecott Copper, Sinclair Oil and Standard Brands jump in the air, but then something happens. At 10.25, General Motors shares are offered at a loss of 80 cents per share, putting the room into panic and starting a chain reaction.

One of the traders shouts at the top of his lungs: “sell market, sell on the market”, a signal that any bid will be accepted and soon the stock exchange starts to look like a train station during rush hour. Traders call out, pushing

**A newspaper headline with unforeseeable consequences: the panic spread quickly to the rest of the United States and the wider world.**



**President Hoover lost voter confidence after three years of crisis.**

## Hoover let things slide

America's 31st President, Republican Herbert Hoover, had high confidence that market conditions would solve all problems. When he took office in the spring of 1929, Americans had confidence in their technocratic leader. But a few months later, after the great stock market crash, the situation changed.

Hoover wouldn't use public money to fight unemployment and poverty; he believed using state aid would harm individualism and morality. He relied on voluntary aid and market conditions, which failed to work. In 1932 when the crisis peaked, Hoover lost the election to Democrat Franklin D Roosevelt.

each other around. At table one, a team of traders is pressed firmly against the table by a hysterical mob who have a particular interest in traded telecom shares from Du Pont, while a large perspiring broker shouts senseless orders into the air from table four.

Strips of paper ticker tape are swirling around the hall, and on the street New Yorkers can hear howls from the stock exchange floor. Suddenly, some shares have no buyers at all. It creates “air holes” with vertical price drops – until a broker finally dares to strike.

**Wall Street, 24th October 1929, 10.50.**

**A man climbs on to the exchange's roof. Rumour has it that he plans to commit suicide – it turns out he's a workman.**

In the last 20 minutes, shoeshine Pat Bologna has tried to push his way through the wall of people into the exchange building.

He wants some advice, but soon realises that it is impossible. With everyone screaming at once, Bologna decides against it. The shoeshine remembered the advice he received when he polished shoes for Charles Mitchell, director of National City Bank:

“A wise man never sells out at the first sign of trouble”. The words persuade Bologna to





turn around and go against the flow. It's gone far enough, he thinks.

### **Wall Street, 24th October 1929, 12.20.**

***The exchange telegraph cannot keep up with the volume of trades. Transactions are one hour behind, so no one knows the real share prices. Panic increases.***

In front of JP Morgan & Co. Bank on Wall Street, hundreds of people have gathered, but because of the huge influx of customers, the doors to the bank are closed.

Shortly before noon, a man appears with his shirt sleeves rolled up. He walks rapidly towards the closed doors. Hordes of people recognise him as Managing Director of the National City Bank, Charles Mitchell. Along with five other of America's most powerful bankers with a total control of \$6,000,000,000, or twice the US budget, he has been summoned to an extraordinary meeting. At 12.20, the men stroll out of bank building again. With their exit, rumours spread that they have created a huge dollar fund to stabilise the market.

### **Wall Street, 24th October 1929, 13.30.**

***The economic team at JP Morgan has decided to send a strong message: banks believe in the stock market.***

Vice President of the Exchange, Richard Whitney, enters the stock exchange. The shouting on the floor dies down. He walks confidently up to the second table.

"What's the last bid for US Steel?" he says in a loud voice. Everyone can hear him.

"\$195", is the answer.

"Let me buy 10,000 shares at \$205". A silence fills the room before everyone breaks out cheering. Richard Whitney goes from table to table to bid prices up. The market improves markedly. The upturn is just as amazing as the previous decline, and when the day is over, the stock index closes at 299, just six points lower than at the start of the day.

### **New York, 25th October 1929. *The turmoil of previous day led to a record turnover of 12,894,650 shares. Richard Whitney's action has worked.***

John Raskob and James Riordan are relieved: the market is stable again. It confirms to both men that there is enough money in Wall Street to finance the Empire State Building. Confidence in the stock market is also emphasised by President Hoover, who states that it's "good and safe ground".

Even the advice columns – from New York's famous astrologer Evangeline Adams – sound optimistic again. She had previously predicted a declining market, and now hundreds of bewildered investors are seeking out the

astrologer's office. Because of the massive influx of customers, she has to take the appointments in her spacious waiting room. According to the astrologer planets are aligned in such a way that there are "good times ahead". The prediction helps the hundreds of small investors forget their worries and continue to buy.

### **Wall Street, 29th October 1929, 6.00.**

***The market is still declining. The day before the stock index fell from 295 to 261. Everyone expects a new, explosive day ahead.***

As morning dawns, a team of technicians led by stock exchange inspector William Crawford are getting ready to test the ticker.

The small group of men in overalls, spent all night inspecting the system and Crawford knows that the first brokers are already on their way to Wall Street from New York's suburbs. ►

***Rumours of the great crash spread quickly across New York. Wall Street was filled with people wanting to sell their stocks. At Trinity Church (in the background) speculators prayed to God for help.***







**9,000 banks closed, companies went bankrupt, and millions of Americans ended up on the street. Many had to leave their homes and live in slums, called "Hoovervilles" after President Hoover.**

POLFO/COBBIS

## Depression hits UK and Europe

Europe quickly felt the effects of the Wall Street Crash as US banks called in their foreign loans, which in turn decimated global trade and devastated economies.

In the UK, unemployment more than doubled to 2.5 million by the end of 1930, but in Germany the consequences were more severe. It had financed the rebuilding of its post-WWI economy with US loans and its collapse helped Hitler to power.

Relieved, the inspector finds that the system works perfectly and is ready to face the new day's challenges.

One of the first to arrive at the stock exchange is Dr Glazebrook. The 51-year-old doctor treated shell shock during WWI, but now looks after the medical centre at the stock exchange. Normally, his office is only open to employees and brokers, but in recent weeks Glazebrook has stayed open for people in the guest rooms too. He plans to do so today too.

It is not long before the stock market is buzzing with life. Rumours say that there have been some unusually large orders over the course of the night, and then approaching 10.00, the hall is full of people.

Ten, nine, eight, seven... The countdown ends, but no one can hear when the stock market bell opens for trading because an inferno of yelling and screaming rises from the stock exchange floor as brokers run around like wild animals.

"20,000 on the market!"

"40,000 sell, sell!"

"50,000, sell on the market!"

During the first 30 minutes, 1,500,000 shares are offered for sale. But nobody wants to buy. The traders bang down their boards and panic washes through the stock exchange like a tidal wave. General Motors, Anaconda Copper and Radio Corporation of

America (RCA) are considered solid securities, yet are all in free fall and nobody can do a thing.

The Exchange's Richard Whitney, the hero of 24th October, is being pushed around like everyone else and nobody can hear him shout "buy" or "sell". In the corner, several brokers are carried away sobbing by Dr. Glazebrook's nurses. Others pray loudly to God.

RCA shares that were sold for \$420 a few days ago are now worth just \$26. DuPont shares plummet from a high of \$217 to just \$80, while GE drops to \$210 from a high of \$396. United States Steel falls from \$261 to \$166. This is a bloodbath.

For a few minutes, the mechanical panel in the middle of the room stops, but far worse is the fact that updates have been delayed for up to two and a half hours. The Exchange's telegraphs that were tested and examined during the night can't keep up. Brokers across the country are groping in the dark.

Outside the stock exchange building, mounted federal police arrive to restore order. People gather around the ticker as it shows prices in freefall.

**Wall Street, afternoon. In Trinity Church, Protestants, Catholics and Jews assemble to pray – something that has never happened in New York before.**

Shoeshine Pat Bologna stares, shocked at the large crowd pressing up against the front of stock exchange building. It is inconceivable that he could ever get inside, so he finds a phone to try to make his sale.

When Bologna finally makes contact with a broker, the value of his shares has more than halved: His investment of \$5,000 is being sold for only \$1,700.

**Wall Street, at close. Disaster strikes.**

**Dow Jones' stock index has fallen to 230. The day will go down in history as "Black Tuesday".**

Brokers leave the stock exchange building. Many put their head in their hands. Up to \$14 billion has been wiped off the value of the stock exchange. In just five hours, the US has lost more money than it spent on WWI.

In the hours following, many investors find an escape – some shoot themselves, others go crazy and head for the sanatorium.

Groucho Marx's phone rings. On the other end is a friend who says only one sentence into the phone: "Marx, the game is over!"

Groucho is in shock. His \$240,000 shares in United Corporation, which he originally bought at \$60 after a tip from an elevator operator, are now trading at \$3.50.

At the Ritz Hotel, two men open a window, throw their arms up in the air and jump.



They had an account together and have now lost everything.

**New York, 8th November, 1929, at 17.50.**  
*Shares continue to drop. The situation is hopeless. The Great Depression begins.*

While John Raskob struggles to maintain hope for the Empire State Building, his friend James Riordan sits in the office full of guilt. Six months ago, the two friends drank dry martini while shares just rose and rose.

Now the market has collapsed and Riordan has lost millions. At the same time he feels a crushing responsibility for the many people his bank has advised. They believed in the exchange's promise of wealth and gambled by borrowing money to play the stock market. Shortly before 18.00 he puts a gun to his head and pulls the trigger.

**USA, 1932. In the past few years, the crisis has gone from bad to worse. During the presidential election on 8th November, Hoover lost by a large majority. His successor will be new president, Franklin D Roosevelt.**

The mood is depressed. From cafés and bars you can hear popular tunes, like, "Buddy, can you spare a dime?"

The Dow Jones' index reaches its low of 41 during the summer of 1932, and 14 million Americans are now out of work – the equivalent of 32.6 per cent of the workforce.

Since the crash of Wall Street, 9,000 US banks have gone bankrupt and without warning closed their doors; their customers have lost all their savings. Neither politicians nor economists know what to do, they are at their wits' end.

Authorities have registered more suicides than usual, but the worst thing is the long-term

effects: unemployment, hopelessness and distrust. Small savers do not believe in the banks that close one after the other. Banks will not lend to businesses, and women no longer trust their honest men who secretly invested the whole family's savings in the fatal dream of a fast buck. And the mechanic, who **once made a \$100 investment, now owes over \$900 to the bank, plus interest.**

One of the few bright spots is John Raskob's Empire State Building, which although barely funded opens in 1931. It was supposed that the skyscraper would be the symbol of America's wealth; instead, it creates hope in the darkness.

In March 1933, Franklin D Roosevelt became president. Throughout the 1930s, his New Deal policy slowly turns the crisis around. It provides billions of dollars of public investment in schools, roads and dam projects that create jobs. Besides introducing the new policy, Roosevelt's government introduces a minimum wage and limits business monopolies. About 1940 – after almost 10 years of economic depression – the US is on the road to recovery.

Many years later, Groucho Marx is invited to a tour of the New York Stock Exchange. Here he suddenly grabs the microphone:

"Gentlemen! In 1929, I lost hundreds of thousands of dollars on this floor, now I intend to get value for my money!"

Over the next 15 minutes Marx jokes, dancing and singing around all the trade stalls.

Outside, the proud shoeshine Pat Bologna is still polishing. He's still share-speculating with his customers – and still gets tips for his hard work. Pat's still there until he retires in the early 1980s.



**In panic, Americans started to sell off their belongings, but there was no one to buy them.**

POLFO/ULLSTEIN BILD

#### FURTHER READING

- Alex Woolf: *Days That Shook The World: The Wall Street Crash*, Wayland, 2002
- Erling Bjøl: *Gyldendals USA-historie*, Gyldendal, 2002
- Gordon Thomas & Max Morgan-Witts: *The Day the Bubble Burst – A Social History of the Wall Street Crash*, Doubleday & Co., 1979

## US EXPORT CRISIS

**From Wall Street the crisis spread throughout US companies, banks and its population as one bankruptcy followed another.**

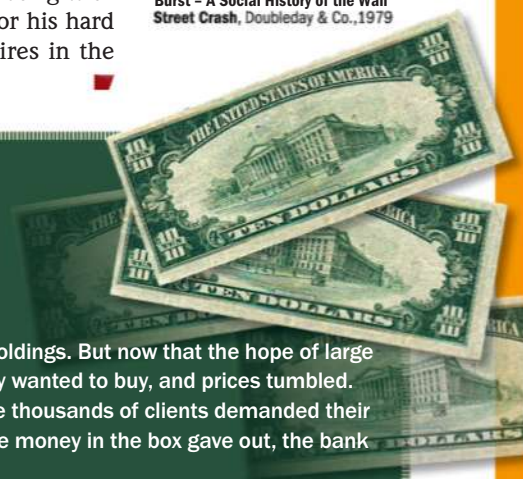
**A**fter the crash, people blamed Republican President Herbert Hoover's inaction for the disaster so they voted for the new Democratic President Roosevelt.

Later studies have revealed that there was extensive market manipulation and dubious transactions between banks and some private investors – helped by paid journalists using their newspapers to advertise individual shares.

This meant that during the 1920s shares no longer traded on the basis of the companies' actual value. And when prices began to collapse, speculators hit trouble, because they worked with borrowed money. In order to repay the loans they

had to sell their shareholdings. But now that the hope of large gains was gone, nobody wanted to buy, and prices tumbled. Banks were hit because thousands of clients demanded their deposits paid. When the money in the box gave out, the bank was bankrupt.

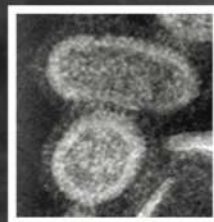
To find the money, banks terminated their foreign loans. Shortly afterwards, the government raised tariffs across the United States to help protect its companies. Other countries retaliated with import duties and devalued their currency to make exports cheaper. The result was a worldwide crisis that lasted a decade.





*A mysterious virus caused millions of painful deaths. The worldwide epidemic started on a military camp in Kansas, USA, and all sorts of ineffective efforts used to curb it.*

POLFO/SCANPIX/CORBIS



*On a military base in the United States, a group of soldiers suddenly begin bleeding from their mouth and ears. Doctors fear that the plague from medieval times has returned. The mysterious illness is spreading at lightning speed across the entire nation, and a few weeks later three continents are affected. The following year...*

# 50 million SPANISH



1918-19

On 6th April, 1917, US President Woodrow Wilson gave congressional authorisation to enter WWI. The subsequent crowded barracks and ships transporting troops from one continent to another created the perfect conditions to spread an epidemic worldwide and create a pandemic.



BY ELSE CHRISTENSEN

Nothing in his career could have prepared William Henry Welch for the sight that awaited him at the infirmary at Camp Devens, Kansas, USA, in September 1918.

Doctor Welch was renowned for his ability to keep a cool head. With his practical and methodical approach, he was a distinguished representative of the new, modern breed of doctors: well-educated men who, armed with tubes and stethoscopes, were winning the battle against disease and suffering. Welch, who also was a true patriot, had left a position at one of America's most prestigious medical schools to work for the army about the time the United States entered WWI.

The men lay on camp beds and on the floor of the large, open room. They moaned in their delirium, tossing and turning in their bloody sheets. Many faces wore a bluish hue.

The buildings were designed to house 2,000 patients, yet here there were 8,000 hospitalised. 63 patients had already died that day as Welch went on his rounds, stepping over corpses to enter the autopsy room. There was not enough room in the morgue for all of the dead bodies.

#### **Doctors could not exclude plague**

During the investigation, Welch noticed that the dead man's lungs were damaged and full of blood. His colleagues took a look too. They knew that Welch had travelled in the east and studied exotic diseases, and hoped that he could clarify what had happened. But Welch stared ahead, visibly shaken. "It must be a new kind of infection", he ▶

# die from FLU



said and then used a word 20th Century physicians thought wasn't even in the dictionary anymore: "plague".

Whatever it was, the disease echoed the plague in some respects. Patients had a fever, headaches and pain throughout their body. They felt as if their bones were broken. Even the lightest touch was painful. Patients bled from their mouth, nose and ears. Some coughed up blood, so violently that they strained their diaphragm and damaged the cartilage in their ribs. Often death occurred within 48 hours. In the final stages of the disease their lungs were so damaged that the patient's fingers and face turned blue from lack of oxygen.

### Army Command gets alert

US Army Medical Corps had already noted that the disease ravaging Camp Funston near Camp Devens in Kansas, where Welch was puzzling over the plague-like symptoms. The doctors also knew that troops had already landed in Europe. The Chief of Staff received the information, but as yet had no reason to take special measures to stop the infection from spreading. They had other things to do.

In the spring of 1918, war was raging unabated. The beleaguered English and the French waited, hoping that the American troops would come to their aid. German shells rained over Paris and French President George

Hospitals employed anyone who was prepared to lend a hand. The long lists of patients with red crosses spoke volumes.



Clemenceau appealed to his US counterpart, Woodrow Wilson, to "ask his Americans come over here quickly". The Americans were busy sending more troops. At the same time, it was important to maintain the momentum in domestic arms production. Few had the time or inclination to deal with the soldiers. Furthermore, any mention of a possible epidemic would only encourage the enemy and damage morale on the home front.

In addition, everyone knew that disease and war belonged together. In

the American Civil War (1861-1865), twice as many soldiers had died from disease rather than in battle. That ratio increased to 6:1 during the Spanish-American War in 1898, and in the Boer War (1899-1902) ten British soldiers died from disease for every one who died on the battlefield.

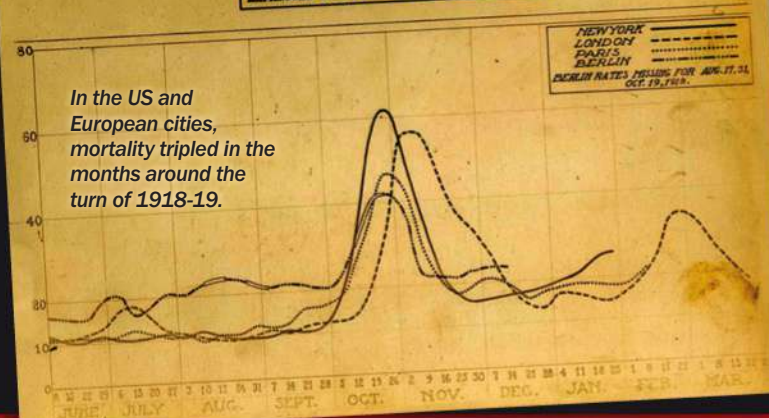
WWI was no exception. At the Front, those in the trenches knew that infectious diseases could flourish.

Danger also lurked on the home front. Since the United States entered the war in April 1917, the US military

## The world had never seen a major epidemic

### INFLUENZA PANDEMIC MORTALITY IN AMERICA AND EUROPE DURING 1918 AND 1919

DEATHS FROM ALL CAUSES EACH WEEK  
EXPRESSED AS AN ANNUAL RATE PER 1000



The disease claimed more victims than the medieval plague and WWI combined.

<b>EARTH:</b>	c. 50 million
<b>USA:</b>	c. 675,000
<b>Asia:</b>	c. 20 million
<b>India:</b>	over 10 million
<b>Europe:</b>	c. 2.3 million
<b>United Kingdom:</b>	c. 250,000
<b>France:</b>	c. 400,000
<b>Scandinavia:</b>	c. 89,000
<b>Others:</b>	c. 25 million

(Source: [eurosurveillance.org](http://eurosurveillance.org); Barry, Stanford; Sundhedsstyrelsen; Statistisk Sentralbyrå; Eila Linnanmäki; Nationalencyklopedin; BBC News)



embarked on a massive mobilisation exercise. Soldiers were crammed into huge military camps, often housing up to 50,000 men. They came from all corners of the country – from big cities and from remote farms. In the camps they were exposed to viruses and bacteria that they'd never come across before, and therefore had no immunity. Also, urban life provided good conditions for infectious diseases to thrive. Thousands of people flocked to work in war industries and crowded into cities with insufficient housing. Several factories worked around the clock, many workers shared both a room and a bed where they worked and slept on shift.

#### Disease spreads all over the world

In the autumn of 1918, the disease suddenly struck across three continents. The first outbreak was registered in Brest in France. Brest had a great, deep port and received almost half of all troop transport from the US into Europe. In mid-August, a group of Americans who had just gone ashore became sick. They died in a French hospital. Within days, dockworkers in Freetown in Sierra

Leone in West Africa also fell ill. The city was also the place where ships bound from Europe to South Africa and the East picked up coal.

*Some coughed  
up blood, so violently  
that they strained  
their diaphragm  
and damaged  
the cartilage in  
their ribs*

west, hitting the cities especially hard.

In 1918-19, Philadelphia, in the state of Pennsylvania had lost 1.7 million citizens, mostly workers employed in weapons and heavy industry who lived close to slums. There were more than 300 deaths a day to the “Spanish flu”, as the disease had been dubbed, making it by far the city’s most common cause of death. Within a few weeks, US authorities realised that something disastrous was about to happen.

#### US is hit on all coasts

In an attempt to stop the spread of infection, the authorities adopted “Assembly bans”. Schools, theatres, and churches were sealed. Even ►

The disease had suddenly evolved from a local phenomenon in a Kansas barracks to an epidemic of global proportions.

The pandemic was spread by humans via shipping routes, roads and railways. On the American continent, it travelled from east to

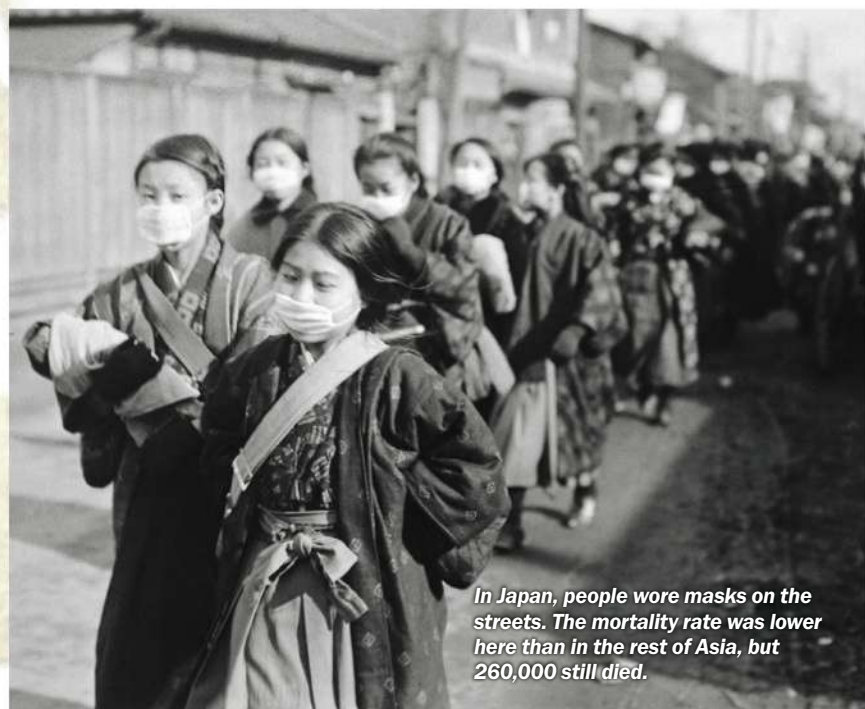


*Spain's Alfonso XIII was infected. Spanish newspapers' detailed coverage gave the disease its name.*

### The Spanish press made the disease known worldwide

**S**pain was hit hard by the first wave of the disease in the spring of 1918. In May, every third inhabitant of Madrid was sick. Trams stopped running and government offices closed. The country was neutral in WWI, so the press was not subject to war censorship and could write about the outbreak in detail.

Press interest was further piqued when King Alfonso XIII became ill. The King survived, and the worldwide publicity surrounding the event, coupled with a lack of a precise diagnosis, led to the disease being named “Spanish flu”. The disease’s second wave killed more than 120,000 Spaniards, a third of them aged between 20 and 40 years. This huge loss of young, productive citizens was partially responsible for the global economic downturn after the war, sending Spain into deep debt and political instability.



*In Japan, people wore masks on the streets. The mortality rate was lower here than in the rest of Asia, but 260,000 still died.*



gatherings for funerals weren't allowed. If people went outside, they had to wear a mask over their nose and mouth. The previously busy streets were deserted. A doctor from Philadelphia, who lived nearly 20 kilometres from the hospital, drove home from his shift one evening without meeting a single car; a few weeks beforehand it had been a bustling metropolis.

Across the United States, on the quiet urban streets the only people you'd come across were policemen in long dark coats with white masks over their faces. They made sure that the rules were respected: no access to public transport without a mask, no meetings and no spitting on the streets. "To spit means death", warned large posters. In some parts of the country it was forbidden to shake hands.

Occasionally, people stopped to put a sign on the door to warn neighbours: "Sickness". Behind closed doors lay the dead, surrounded by their families who – if they weren't already ill – soon would be. Nurses were called out and found entire families sick or dying. It was not uncommon for a family to lose two members in those terrible days during September and October.

On house doors, pieces of crepe were hung, marking the deaths: white for families who had lost a child or someone young, black if someone middle-aged had passed away, and grey if the deceased was elderly. It kept people informed of the tragedy unfolding within their neighbourhood.

No one had the strength to deal with the bodies that were piling up. The morgues were quickly crowded, so the dead were laid under ice outside or remained in the house – often isolated from the main house or apartment's other residents. There were no coffins and no one to dig graves as the men were either ill themselves or refused



GETTY IMAGES



The French took to the streets to encourage everyone to wear masks. Doctors' futile treatments were the subject of caricature drawings during the time.

to go near someone who had died of "Spanish flu". In Philadelphia, the city council finally acquired a steam digger that could dig a mass grave in the city's Holy Cross Cemetery. The number of sick and dead varied across the country, with the eastern and southern states worst affected. From Seattle to New Orleans and New York, it was the same story with crowded morgues and crepe on the doors.

*"If the epidemic continues its mathematical rate of acceleration, civilisation could disappear from the face of the earth within a few weeks"*

Victor Vaughan, US Army Doctor

#### Unskilled workers in hospitals

The US civilian health system was already running at full tilt when the "Spanish flu" struck. The country's war effort had tied up most of the country's experienced doctors and nurses. In the autumn of 1918 the authorities urged all retired doctors and nurses not working on the war effort to

resume their old jobs. As conditions became more and more chaotic, the lack of nurses was so high that hospitals called everyone in, even if they only had

a first aid course. All "with two hands and the willingness to work" were asked to help with cooking, laundry and other practical tasks. The Red Cross was busy with the war, yet its volunteers still gave a hand to the sick at home.

Newspapers mentioned the deaths, nestled between the other obituaries. But, at the same time, editors tried to keep any mention of "Spanish flu" quiet, so as not to frighten the population and damage the morale of the warring nation.

**Travel is as dangerous as the enemy** Troop transportation continued as before. Loaded to the brim with soldiers, ship by ship sailed into France. The young men were on their way to war, but their struggle for survival began in poorly ventilated cabins below deck.

On 29th September, 1918, *USS Leviathan* sailed to Europe. The ship was built for 6,800 men, but had 11,000 on board. On the way to sign on, several of the soldiers fell from the ranks and were taken away by ambulance. Before departure, another 100 were taken away and before the sun went down on the journey's first day, 700 people had fallen ill. Colonel E W Gibson later recounted: "if you've not



seen it, you can imagine the conditions. Pools of blood from the patients' severe nosebleeds spread around the room. The deck was wet and slippery... Moans and screams from the terrified added to the confusion of those who cried out for help. On the whole, it was a living hell."

Deceased sailors were usually cleared of all body fluids, which were then replaced with a preservative. In this way, the bodies could reach the land before decay set in. In shipping history, it was noted that "the small group of embalming-savvy crew cannot keep up with the death rate – it's impossible to embalm corpses quickly enough – there are signs of incipient decay on some of them". When the ship reached Brest, 2,000 were ill and 70 had died. 14 were too sick to leave the ship and died on board. Those who could afford it were carried on makeshift stretchers to US field hospitals, where hundreds more died. For those soldiers who sailed to France in September 1918, the probability of dying along the way was at least as high as being killed in action.

President Wilson's military Chief of Staff was Peyton March, who brushed aside all proposals to restrict shipments and introduced quarantine before departure. Troop transport would not be limited or even stopped, and every



*Fears of the epidemic lasted for decades. In 1946, actors wore masks when rehearsing for the film **Beast With Five Fingers**.*

soldier who died during the voyage, "just as surely played a role in the war as his companion, who died in France", March stated firmly. And so the contagion was spread to Europe's war-torn population.

#### **Germans become too tired to hate**

Konrad Adenauer, Mayor of Cologne and later Federal Chancellor of West Germany, summed up the mood in his homeland when in October 1918, a month before the end of WWI,

he declared that the disease made "people too tired to hate". In Frankfurt, more than a quarter of all who were hospitalised with the disease died. In England "Spanish Flu" came "like a thief in the night", according to George Newman, the country's senior military doctor, in the official report on the epidemic. He wrote that "the disease was one of history's greatest scourges, a plague... which took more than 150,000 in England and Wales alone".

Across Europe, schools were closed and gatherings banned, while the bars and shops were used as emergency hospitals. The disease was widespread, affecting virtually every part of society.

Overall mortality however, was less than one per cent of the population in Western Europe. Elsewhere, it was far worse: people in remote areas had rarely been exposed to viruses and therefore had no immunity. For them, the disease was disastrous. Among America's indigenous people, Eskimos and many African tribes, small communities were wiped out. A British visitor in Gambia reported that entire villages of 3-400 families had simply disappeared. Houses collapsed, and the jungle was well on its way to engulfing the derelict villages.

In India the "Spanish flu" spread like wildfire. According to Indian ▶

## **The flu was already rampant in the 1500s**

**Before scientists knew what the virus was, millions had died from the flu.**

**With the invention of the microscope, doctors could prevent major epidemics.**

**1580:** the first reports of an epidemic that, with reasonable certainty, can be identified as the flu are from 1580.

The epidemic originated in Asia and came to Europe via Africa. In Rome, more than 8,000 people died, and several cities in Spain were almost destroyed. Throughout the 17th and 18th century more flu epidemics periodically emerged.

**1889-90:** in the late 19th Century, about one million people died from a flu that originated in Asia. From there it spread through Russia to Europe where it was named "Russian flu". The epidemic also reached both North America and Africa.

**1918-19:** "Spanish flu" killed 50 million people in just one year.

**1957:** "Asian flu" emerged in China in early 1957 and spread to the entire world. Researchers used a microscope in 1930 and could now identify the virus. In 1957, doctors developed a vaccine. "Only" about a million people died of the disease.

**1968-69:** "Hong Kong flu", which hit the world in 1968-69, was a mutated form of "Asian flu" and many people were immune to the disease because they had been vaccinated. Globally, about 750,000 people died.



SCIENCE & SOCIETY



tradition, bodies were burned and the ashes thrown into the river. Firewood ran out, so bodies were thrown straight into the rivers. In several places in Africa and the Far East, one in ten died.

Victor Vaughan, the doctor responsible for monitoring the development of infectious diseases for the US Army, was horrified by the reports he received of disease's behaviour:

"If the epidemic continues its mathematical rate of acceleration, civilisation could easily disappear from the face of the earth within a few weeks", he noted.

### Desperate treatment

The medical profession was still baffled by the "Spanish flu". They wondered why – unlike with previous epidemics – it hit the youngest and strongest hardest. Those who normally died were children and the old, but the killer had a penchant for those aged 15-45.

Around the world, researchers tried to find the cause – and in turn, a cure. Most thought the virus Influenza B was the culprit. However, it turned out that some patients didn't have the virus. Other researchers found many other viruses and bacteria, which might also have been the cause.

Scientists had known of the virus since the late 1800s, but still didn't have a microscope



The Red Cross made a special effort to recruit workers who were needed in hospitals. In St. Louis, Missouri, USA, they drove ambulances through the deserted streets.

*People were advised to cover their mouths when coughing, keep clean and avoid tight clothing.*

*US Authorities, Washington*

strong enough to definitively identify it. Attempts to find the cause brought up different viruses that were suspected of causing the disease but none led to useful conclusion. In trying to treat the sick, doctors resorted to desperate measures. In Greece, doctors prescribed a medical mustard plaster for their patients, draining the blisters

and spraying the liquid mixed with morphine, strychnine and caffeine onto the sick. In Italy, patients were treated with milk enemas mixed with a drop of creosote (a coal tar-based substance that, among other things is used for treating wood) every 12 hours. Old methods of cupping and bloodletting were also retrieved from the medical

## "Spanish flu" was bird flu

Flu, which in 1918-19 infected many hundreds of millions of people and killed 50 million, was not just extremely contagious, it was also unusually deadly. Since 1918, scientists have tried to identify the virulent virus: and in 2004 they succeeded. US researchers studied slices of lung tissue from an American soldier who died in 1918 from the disease. They recreated the gene sequence that 86 years previously, sat on the surface of the deadly virus in the soldier's lungs, studying its shape using highly developed X-ray technology. The conclusion was that

the virus in 1918 was very similar to bird flu, which had raised fears of an epidemic in 2003.

This dangerous type of flu is found in birds and is usually only transmitted from bird to human, not between humans. The studies from 2004 showed that in 1918 the virus had mutated so that it was also incredibly infectious between people.

The killer virus from birds may also yet develop into another pandemic in the future.

*In 2003, Bird flu revealed that a flu pandemic can strike anytime. Millions of poultry around the world were then destroyed.*





archives. Families believed that they would stay healthy if they ate onions at every meal. Thousands of children were forced to sniff salt up their noses, and a woman in Alberta, Canada, was sure that she had been cured by wearing a turpentine jacket over her chest.

A directive from the British War Office recommended alcohol as a preventative measure. The US authorities were less specific – Washington advised people to cover their mouths when coughing, keep clean and avoid tight clothing.

### Paranoia begins to spread

Without any scientific resolution, the population began to wonder. Many thought that the disease was the Germans' work. In June 1918, the New York Times mentioned the new plague as "the German disease". In late summer, a rumour began to circulate that German submarines had smuggled the influenza virus into the United States and let it loose in theatres and places with large gatherings.

Some thought that war, with its new weapons and poisonous gas, had triggered the epidemic, while others felt that the smoke from exploding shells, together with the vapour from decomposing corpses in the trenches might be the cause. Most came up with more mundane and reasonable explanations, such as that the infection came from fleas or dirty dishwater.

Enterprising businessmen welcomed "the Spanish flu" and its new opportunities. "One way to keep the disease away is to keep your feet dry", lured a shoe store, while a quack promised that "you are safe when you take *Father John's* medicine". The manufacturer of Vick's Vapour Rub, an ointment applied to the neck, back and chest, explained that the vapours from the ointment would reach "directly to the affected parts".

### The epidemic stops abruptly

Apparently nothing could stem the "Spanish flu". And, just as suddenly as it started, it suddenly disappeared.

While the bells rang for armistice on 11th November, 1918, the epidemic slowly began abating. In America's big cities, sirens wailed as a sign that citizens could take off their masks and let society go back to normal. Over the winter and spring, new bouts of illness

## Sick President asked for peace

**Weakened by the "Spanish flu", the US President tried to persuade Britain and France to stop the revenge against Germany.**



◀ Britain's Lloyd George, France's Georges Clemenceau and US President Woodrow Wilson ended up humiliating Germany with the punitive Treaty of Versailles.

Even before the United States entered the war, President Woodrow Wilson declared that he would ensure "peace without victory and without humiliation for the loser ... otherwise there will be contempt, a bitter memory upon which peace would rest – not permanently, but only on quicksand". His words, which he'd keep repeating, would prove chillingly prophetic.

Wilson was thwarted by his allies. The victorious British and French were determined, and a few days into the peace negotiations with Germany, Wilson was ill. He had a high fever and a violent cough. The president's doctor diagnosed: "Spanish flu". After five days in bed, the president was back at the negotiating table.

He was clearly weak, had difficulty remembering and overly suspicious. He had also changed his attitude to the peace treaty; a few days later he agreed unilaterally to give Germany the blame for the war, imposing large reparations on the country. It would also be demilitarised and the Germans would be deprived of significant land.

Historians claim that Wilson's willingness to make concessions to England and France was due to feeling weak from the Spanish flu.

The president never regained his health, and in autumn 1919 he had a severe stroke and eventually died in 1924. Lack of reconciliation with Germany after WWI proved to be fatal. WWII was just two decades away.

came, but the outbreaks were milder and waning. The epidemic died out – and science still hadn't come up with a cause or treatment. Only in 2004 did American researchers discover that it was bird flu.

Historians believe that 50 million people died of "Spanish flu". It killed more people in one year than the Black Death killed over a century. Over five times as many died of the disease as died on the battlefields of WWI. Because so many of the young and strong died, post-war reconstruction was difficult. In the collective consciousness, the disease left

a deep depression. The belief in science and man's ability to make himself master of his own destiny had suffered a serious blow. People lost hope and mingled with the memory of the war, were discouraged in a world where – in author F Scott Fitzgerald's words – "all gods dead, all wars fought, and faith in man shaken to its foundations".

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- Alfred W. Crosby: *America's Forgotten Pandemic. The Influenza of 1918*. Cambridge University Press, 2003.



**PIONEERING  
INVENTIONS**

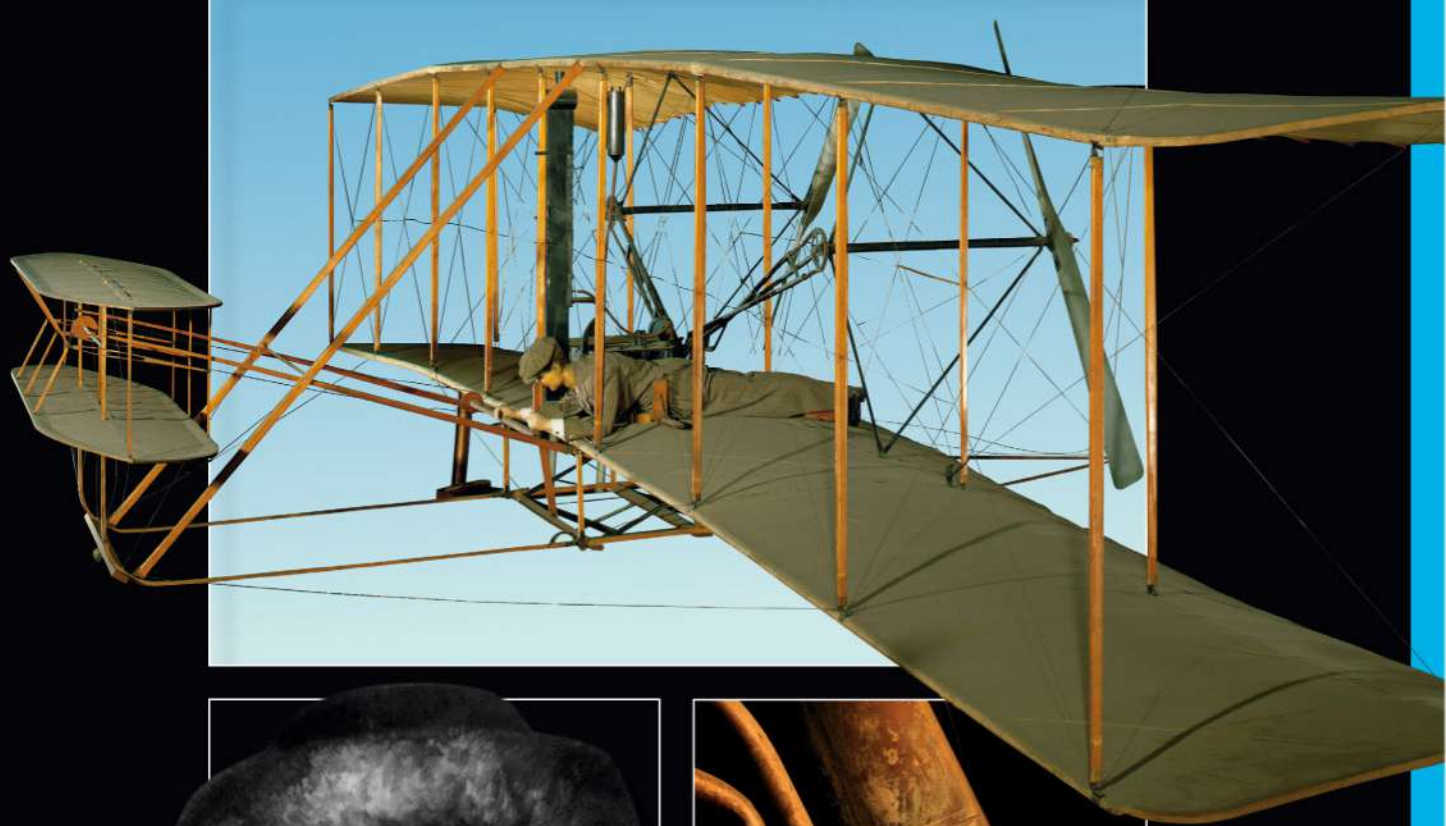
# **FRESH NEW IDEAS**

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The aeroplane fulfilled man's dream of flight and great distances could now be covered easily. The printing press spread the Bible's words and the assembly line allowed mass production of cheap cars. Revolutionary ideas and technical breakthroughs created modern civilisation.

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The printing press  
is the main weapon  
against the Pope:

# Bu divi

Gutenberg's printing press was an early  
taste of industrialisation, mass-producing  
books on an assembly line.

POLIFOTO/ULLSTEIN BILD & BRIDGEMAN





# tenberg des Europe

*Goldsmith Johannes Gutenberg made the written word accessible to all. His press could quickly create a book that had previously taken months to copy by hand. Now the Vatican's opponents could spread their message and it would be heard, dividing the Church all over Europe.*

## EUROPE/1400

The plague had decimated the population. The church held unenlightened and pious Europeans in an iron grip, with no ability to rebel. The disgruntled lacked a voice.





In Victor Hugo's novel *Notre Dame de Paris* a learned man stares gaping at the book in his hands. For the very first time, he flips through the pages of a printed book and admires the perfect lettering on straight lines in vertical columns. He lifts his eyes and thoughtfully considers the gigantic cathedral before him. "This will destroy That", he says. "The Book will destroy the Edifice."

Hugo's fictional character predicts that the printed word will challenge church leaders' monopoly on the truth.

The Vatican version of Christianity had always stood unchallenged. Only the church had the money to let monks spend six months writing to produce a single book. Gutenberg's invention meant that the written word could no longer be reserved for popes, cardinals and bishops.

Now new views and ideas could spread through Europe. The monk Martin Luther used the new invention to change the world.

### Revolution across the world

Goldsmith Johannes Gutenberg was an entrepreneur who had a

good nose for any opportunity to make money. In 1439 he lived in Strasbourg, then part of Germany, and saw an opportunity to make a killing.

Every seven years, thousands of pilgrims would pour into the German City of Aachen, around 270 km (170 miles) to the south of Strasbourg, hoping to get a glimpse of some sacred relics, including the swaddling cloth that Joseph wrapped the infant Jesus in, and the robe worn by the Virgin Mary on the night of his birth.

It was believed that invisible rays from the sun streaming in to the cathedral would release spiritual forces from the relics, and anyone exposed to these forces was assured health and eternal salvation. The pilgrims, who had crossed oceans to see the cloth, had another option: they could use a mirror to pick up the divine energy.

In 1432, Gutenberg had seen blacksmiths in Aachen rushing to

sell metal mirrors, and long before the pilgrimage was over, everything had sold out. He intended to mass-produce no less than 32,000 mirrors and sell them at half the normal price. That would give a total profit of about 15,400 guilders, many millions in today's money, since the cost of the raw materials and moulds would come to just 600 guilders.

No one had ever produced mirrors on such a large scale, but in the summer there came bad news: because of fears of a plague epidemic the pilgrimage was postponed for a year. Gutenberg was left with his thousands

*"The pope must abolish... printing, or printing must root him out".*

*John Foxe, English author, 1563*

of mirrors and disgruntled creditors.

For Gutenberg, the failure provided some valuable lessons: he had practical experience in developing technology for mass production, and not least, he had perfected various casting techniques.

### Lawsuit reveals secret project

In Strasbourg, Johannes Gutenberg had long since earned a reputation for being an enterprising man beyond the failed mirror production, and had been working on numerous projects. One of them was so secret that only his three colleagues and a few assistants were aware of it.

After one partner, Andreas Dritzehn, died in 1439, snippets of the nature of the Gutenberg project came to light. It happened at a trial in December 1439, where Dritzehn's family claimed back the money he had invested in Gutenberg's business. In the file were included "lead", various "moulds" plus something that one of the witnesses said "belongs to printing".

The judgement ruled that Dritzehn's family should be paid a nominal sum, but that Gutenberg could keep the mentioned objects and other means to continue his work on the project.

**Gutenberg's house still stands in Eltville, which lies north east of Mainz.**



PHOTO/JUSTING BILD

## Print becomes a household normality over 1,100 years

For more than a thousand years the use of types and ink had been the domain of professionals. Only when the typewriter was invented in 1868 did print move into people's homes.

# 750

### Koreans press books from blocks

From the mid-700s the Koreans pressed books. A single page was printed using carved and dyed wooden blocks. Today these books are called block books.



# The Chinese were 400 years ahead

**Long before Gutenberg had his bright idea in Europe, the Chinese had thought along the same lines.**

**But the sheer number of Chinese characters prevented the invention catching on in Zhongguo.**

In about 1050, Chinaman Bi Sheng experimented with movable type – 400 years before Gutenberg. All historians know of Sheng and that he cut characters out of wooden blocks. The invention was practically useless, because each Chinese character represented a word or phrase.

It meant that Bi Sheng would need to shape up to 5,000 different types before he could press an entire book, so movable type did not catch on in China.

The Chinese used wooden blocks, developed in Korea in the mid-700s. In 1966 in a pagoda in modern-day South Korea, researchers found a Buddhist textbook from 751. The Buddhist text “Diamond Sutra” was printed in the year 868.

Nearly 700 years later, Europe started to catch up with China and Korea. In the 1420s Dutchman Laurens Coster tried to print with different types and ink – 30 years before Gutenberg. Coster cut types from bark and invented an ink that did not run. However, there is no evidence of this.

*Dutchman Coster supposedly tried using movable type 20 years before Gutenberg.*

*Chinese printers knew the principle of movable type, but the 5,000 characters made it impractical. Instead, they continued to carve entire books into blocks of wood.*

OSPREY PUBLISHING & SHUTTERSTOCK D

Like the mirrors, this project was one of mass production – but no one outside Gutenberg’s tight inner circle could imagine what it might be.

## **Gutenberg is virtually unknown**

Johannes was born with his father’s name Gensfleisch in Mainz around 1400 and as an adult took the name zum Gutenberg after one of the

family’s properties. Around the year 1434, he left his hometown to escape economic and political strife that ravaged craftsmen and older middle-class families, and which threatened to ruin him. In his voluntary exile, Gutenberg settled on the outskirts of Strasbourg.

Gutenberg stayed in Strasbourg until 1448. Here he worked with goldsmiths, the mint and was also involved in the preparation of religious mirrors.

Historians know almost nothing of his life – only that he came from a fine family and by his 30s was ambitious, had a big house and a taste for wine.

Documents from July 1439 show that Gutenberg paid an annual tax on wine for about 1,500 litres. This was probably for his household – around 10 people including servants and assistants. The volume of wine ensured that both those upstairs and downstairs enjoyed ▶

## 1050

**Chinese create movable type from clay**

Around the year 1050, the Chinese made movable type out of clay. The inverted characters were inked and used to print. Once all the images were taken, the type was recycled.

## 1234

**Koreans mould movable type from bronze**

Korean, Choe Yun-ui produced the earliest known movable type from metal. The oldest surviving book printed using metal type is the Buddhist scripture *Jiki* from 1377.



**Choe Yun-ui’s bronze types are from 1234. Nobody knows what he printed.**



# 1454

Six steps from type to print

## Gutenberg reinvents old processes to create something new

A winegrower's ancient grape press inspired Gutenberg to create one of history's most important inventions: the printing press. He used his knowledge as a goldsmith to cast the metal type quickly and cheaply.

### The type was brilliant



*Gutenberg moulded type from tin, lead and antimony.*

DORLING KINDERSLEY

Movable type was the heart of Gutenberg's invention. Each type represented an inverted metal section of a single letter or character. When the type was covered with ink, it worked exactly like a piston and under pressure created a non-inverted version of the letter on a piece of paper. The type could be used to make up any word or sentence and could be reused again and again.

Gutenberg was a skilled goldsmith and used his expertise to develop a method to produce the type rapidly and inexpensively. He could cut a character from the end of a metal rod with a precision of 0.01 mm. He then hit the rod firmly against a piece of copper, which made up the base of a mould. Then he sped up production, creating large quantities of movable type. No one had done this before Gutenberg.

**6** The pressing plate is pressed hard against the back of the paper and the inverted type commits the ink to the paper. One side is printed.

**1** The type is clamped in a frame and placed on the stone with the pressing profiles facing upwards.



*For 400 years printers used printing presses built on Gutenberg's principle. The process wasn't automated until the 1800s.*

DORLING KINDERSLEY





The handle on Gutenberg's printing press was fixed directly onto the screw.



Gutenberg's elaborate type gave a wonderfully smooth image.

**5** The handle screws rotate, moving the pressing plate down towards the back of the paper.

**3** The press frame keeps the paper taut, so that the book's lines are completely straight in the finished work. The frame is tilted down over the type on the press stone.

**2** The hard pad is smeared with ink. Gutenberg's linseed oil colours are particularly good at sticking to the type. The book printer distributes the ink evenly by pressing the pad against the type.

**4** The pressing stone is pushed into the press plate.

around half a litre each per day from the Gutenberg cellar, and suggests home was a lively place.

No documents reveal whether Gutenberg had a wife and children. Back in 1436 a local woman named Ennelin accused him of breaking a marriage promise. As he hadn't kept his word, Ennelin's mother, Ellewibel pulled him into court and demanded compensation. No one knows if Gutenberg paid up – the judgment says her claim was not upheld.

### A stroke of genius takes shape

Unmarried and focused, Gutenberg continued his enigmatic experiments in the workshop in Strasbourg, but in 1448 for unknown reasons he packed all his things and moved to Eltville, north of Mainz. Here he borrowed 150 guilders from a cousin to finance the settings up of a print shop, which included hiring staff and acquiring tools and equipment to realise Gutenberg's grandiose dream.

The money did not go very far, so in 1449 Gutenberg entered a partnership with the wealthy businessman Johannes Fust, who lent him 800 guilders – around £75,000 in today's prices. With the extra funds and in a relatively short space of time, Gutenberg managed to set up his print shop – complete with the inventions he had spent many years working on.

Inspired by a wine press, Gutenberg had built a wooden printing press, which would become the focal point of the entire process and the place where a book's pages were created. But the most groundbreaking of his inventions were the letter moulds from which he could quickly produce individual letters from metal. These were known as movable type, named after the way he put together the text and was able to reuse them time after time. As a ▶

## Readers wanted illustration

Before Gutenberg's invention, handwritten books were elaborately decorated with colourful scripts, designs and drawings of flowers, animals and

narratives. Readers expected impressive decoration in their books, so Gutenberg hired traditional writers and cartoonists in his high-tech workshop.



## 1461

### The first illustrated book

German Ulrich Boner published his book *Edelstein*. For the first time, a book printed with movable type had illustrations. The book contained a collection of fables, printed by Albrecht Pfister in Bamberg, Bavaria.



# Paper is a Chinese state secret

In the year 105 AD the first sheet of paper was made in China. The recipe originated outside the kingdom's borders, and was discovered when Chinese prisoners gossiped about it 700 years later.

Before the invention of paper, the Chinese wrote on silk, which was very expensive. Eunuch Ts'ai Lun resolved the issue in the year 105 AD when he soaked bark, old cotton rags and hemp until the ingredients turned into a uniform fibrous soup. He then placed the pulp in a frame under pressure from large clamps, so the water drained off it and it dried.

Paper had two advantages: It was easier to write on than silk, and the ingredients were cheaper to buy. Emperor Hedi realised its value. Now he could make money from selling beautiful silk garments instead. The recipe remained a secret and no one was permitted to share it. For centuries China's emperors persecuted anyone who tried to break the monopoly.

Despite the ban the recipe slowly moved west. 600 years later, via the Silk Road, it reached the great trading city of Samarkand in present Uzbekistan. After a Muslim invasion of the city in the early 700s, a few Chinese prisoners of war mentioned it. Yet it would still take another 500 years before paper mills appeared by the side of European rivers.

DORLING KINDERSLEY



The paper frame is filled with the wet pulp. The frame holds the net in place, while the water is pressed through the mesh.

1 Papermakers fill the frame with the wet pulp, dissolving cloth or bark, and 2 putting it under pressure. 3 Water runs off and, after drying, the sheet of paper is finished.

finishing touch, he created viscous oil, a linseed oil-based ink that, in contrast to a water-based ink, stuck to the type so the printed font appeared clear and defined on the page.

Initially, Gutenberg printed indulgences, school books, calendars and other pamphlets for the Catholic Church, which earned him an income.

The church was also enthusiastic about his new cheap technology, giving Gutenberg an idea.

## Gutenberg creates a masterpiece

As he became better at using the new technology, a grand plan began to hatch. The former jeweller toyed with the idea of pressing a Bible. Its success was

guaranteed, but Gutenberg had an enormous task ahead if he was to boast about being the first to print the Bible.

Those Bibles already on the market were handwritten fine specimens, and if Gutenberg hoped to build up a customer base of mostly monasteries and churches, his work would need to be better than the handmade bibles in

## 1464

### Printers move to Venice

A number of German printers settled in Venice. In a short time, they took over the canal town of Mainz' position as the capital of print. The printers vied to produce beautiful books with exquisite illustrations.

## 1468 ±

### Johannes Gutenberg dies

Gutenberg died and was buried at the Franciscan Church in Mainz. He was then largely unknown, and when a few years later, the church was destroyed, his tomb was demolished.

## 1500

### Book sales explode

Only five decades after Gutenberg's invention, the number of publications had reached 40,000 titles with 10 million printed copies. This corresponded to about a book for every five Europeans.





**Protestants printed propaganda calling the Pope the "Antichrist".**

SCANPIX/AGK-IMAGES

both splendour and quality. In short, he had to create a masterpiece.

And a masterpiece it was. In the autumn of 1854, after more than two years of hectic toil, Gutenberg and his assistants printed 180 Bibles with a combined total of 230,000 pages: a monumental achievement and a formidable innovation at a time when it could take up to ten years to create a single handwritten copy.

In early 1455 at a large market in Frankfurt, the printed books were shown to a larger audience for the first time. Rows of identical Bibles were offered for sale. Visitors were amazed by the beautiful works.

Events moved quickly: rumours about Gutenberg's revolutionary press spread like wildfire throughout Europe, and on 12th March 1455, Enea Silvio

Bartolomeo Piccolomini – later Pope Pius II – wrote a letter to his superior, Cardinal Juan de Carvajal: "Nothing that has been said about the wonderful man who presented his books in Frankfurt is a lie. His books are extremely elegantly written with the correct letters and without mistakes. Your Highness will be able to read them without glasses".

If Piccolomini had known where Gutenberg's invention was heading, he might not have mentioned him in such glowing terms.

### How printers crushed Vatican power

On 31st October 1517, 63 years after Gutenberg printed his first text, German Augustinian monk Martin Luther was so upset with the Catholic Church's abuse of power that he wrote and published 95 provocative thoughts on the church.

Luther believed that the pope should have known about the greedy attitude among sellers of indulgences, who were peddling them as commodities – "for only so he would know that Peter's Basilica in Rome rests on a foundation of skin, bodies and bones of his flock".

Luther hit the right note in recognising other people's dissatisfaction. Millions

*"Nothing that has been said about the wonderful man who presented his books in Frankfurt, is a lie".*

*Silvio Piccolomini, Italian priest, 1455*

of Europeans bought his books and pamphlets with texts that thundered against the Vatican. Without the printing

press, this would never have been possible.

Over the next 100 years, churches in Northern Europe broke away from the Vatican and professed the Evangelical Lutheran faith, dividing Europe. ■

### FURTHER READING

- John Man: *The Gutenberg Revolution*, Bantam Books, 2002
- Eisenstein: *The Printing Revolution*, Cambridge University Press, 1993
- Karen Brookfield: *Book*, Dorling Kindersley, 2000



**The world's most expensive 550-year-old Bible sold in 1987.**

**This masterpiece cost \$5,400,000**

Gutenberg's first book was a Latin Bible comprising two volumes, totalling 1,282 double-column pages, each with 42 lines. He used 290 different pieces of movable type in the work.

The Bible was completed by writers, providing feature pages with colourful scripts, flowering vines and drawings. No two copies were identical.

135 copies of the original print run were produced on hand-made paper, and a further 45 were printed on parchment. There are 48 copies still in existence – most in incomplete condition.

Scientists estimate that 20 men worked on the book and it probably used six printing presses.

The Bible was probably so expensive that only churches and monasteries could afford it. In 1987 a Japanese man bought a copy through the auction house Christie's for \$5,400,000 – the most expensive book ever printed.

# 1799

## Mass production of paper

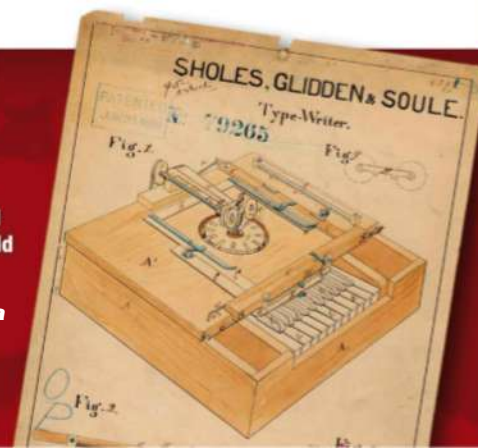
Frenchman Nicolas Louis Robert took out a patent on the first paper machine that could produce a continuous web of paper. This made it possible to make paper on a large scale.

# 1868

## A printer in every home


In 1868, American Christopher Sholes patented the first practical typewriter. Now everyone could write much faster than by hand.

**In 1873, the inventor Sholes entered into a contract with weapons manufacturer E. Remington and Sons – now manufacturer of typewriters.**



NATIONAL ARCHIVES





**Thomas Newcomen invented the first working steam engine, while James Watt's engine (pictured) was equally important.**

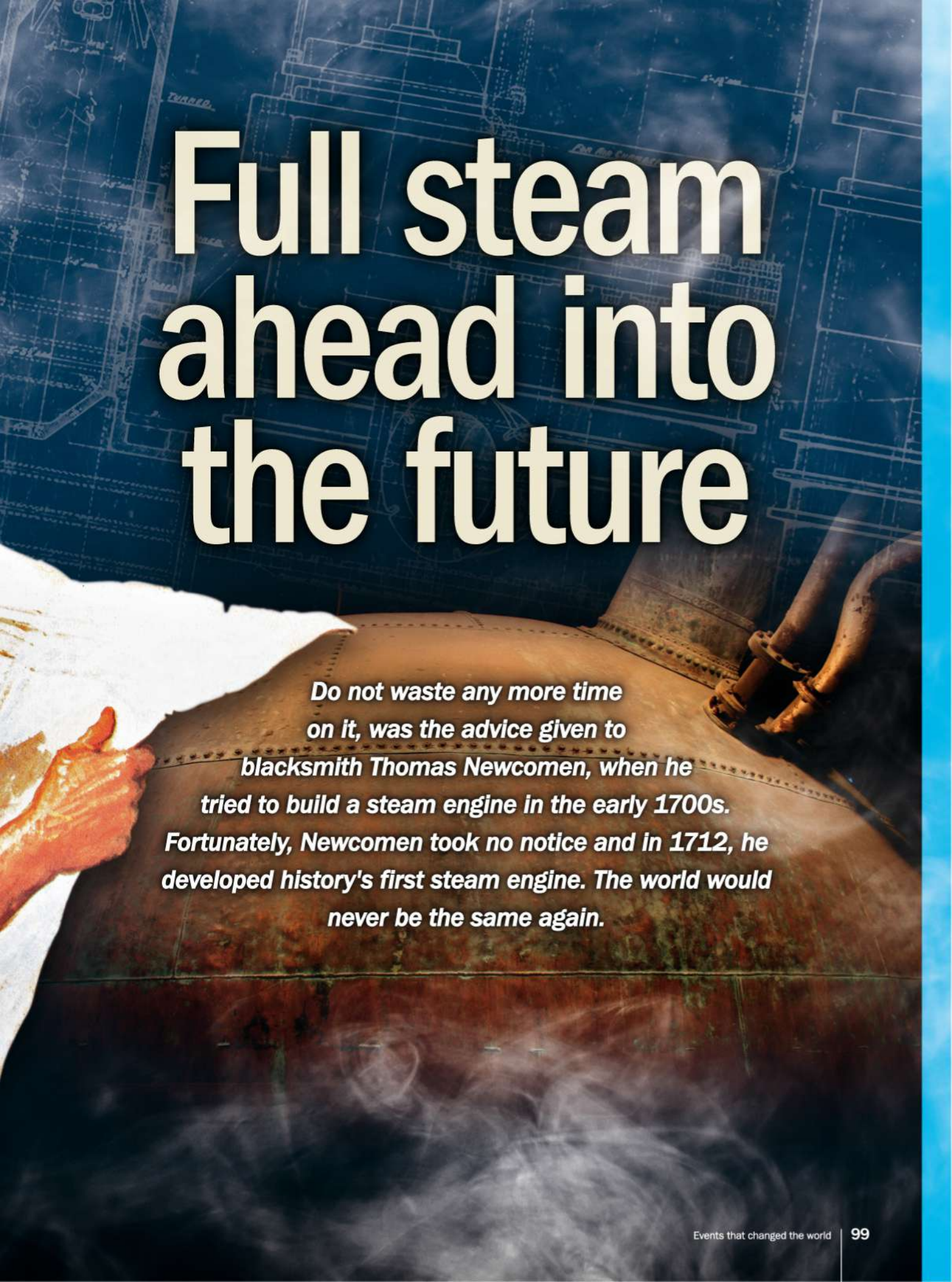
BRIDGEMAN & SHUTTERSTOCK

## GREAT BRITAIN/1712



Britain's industry is mainly agricultural and still uses manual labour. Textiles are Britain's main export and carding, spinning and weaving are carried out by thousands of local women, who supplement their meagre incomes working from their own living rooms.





# Full steam ahead into the future

*Do not waste any more time on it, was the advice given to blacksmith Thomas Newcomen, when he tried to build a steam engine in the early 1700s. Fortunately, Newcomen took no notice and in 1712, he developed history's first steam engine. The world would never be the same again.*



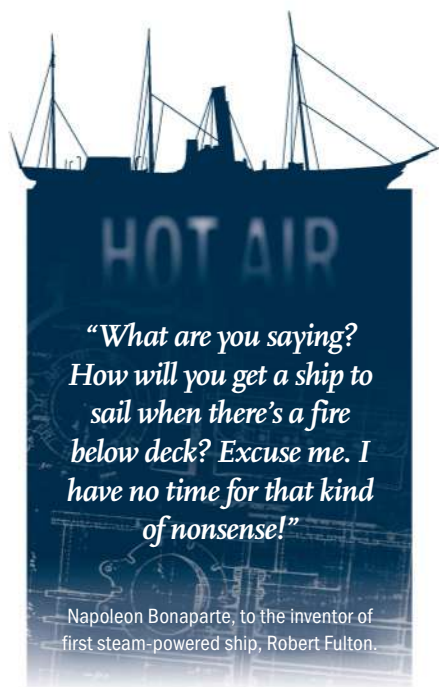
When Robert Hooke, one of the country's leading authorities in the field of science, criticised the work Thomas Newcomen had done on his steam engine, you might have expected him to be discouraged. Newcomen was not put off. He stubbornly kept working on the engine, and in 1712, after ten years of working on his project, he had created the world's first working steam engine.

The idea behind the project was that the engine would be able to pump water from a local coal mine, yet it soon became clear that it could do much more than that.

The steam engine was a game changer, first changing the way things were done in Britain and then, later, the world. This remarkable machine transformed industry. During the industrial revolution it was used to mechanise looms, vehicles and ocean-going steam ships. Newcomen was the man behind the invention of the machine that changed the way we work.

### He built a steam engine in his cellar

Newcomen might be considered arrogant for rejecting Hooke's advice, as Hooke was one of the most prominent and knowledgeable British scientists of the time. He had studied at Oxford University, conducted specialist research on small animals, described



cells, improved the astronomical telescope, developed a light wave theory and quarrelled with Newton over who first discovered the laws of gravity.

Newcomen had no academic background. He was born in Dartmouth on the south coast in 1664, where his father was a ship builder. His family were considered to be upper middle class and could probably afford to send the enthusiastic and gifted Thomas to university to study engineering, but they really weren't sure that it was a good idea as it would test their faith and they weren't comfortable with that. The Newcomen family were Baptists while English universities were unanimously

Church of England, and it did not sit well with the Newcomen's to send their son to a C-of-E establishment. By not going to university, Thomas wouldn't have the opportunities within society that a higher education could offer him, and he resigned himself to that fact. Instead, he took an apprenticeship as a blacksmith. By learning a craft, he could put his practical sense and technical skills to good use. Thomas spent much of his working days delivering tools to local coal mines. The deep mines were so deep that seeping groundwater was a constant problem. The manual pumps and wind turbines that were used often found it hard to keep on top of the incoming water.

Newcomen knew that European researchers were experimenting with steam power to see if it could replace horse and hydropower. In 1698, English military engineer and inventor Thomas Savery had received a patent for a type of steam engine that could be used in mines.

The machine was simple: a metal cylinder was charged with steam from a boiler. Then, cold water was poured over the outside of the cylinder so that the steam condensed into water. This created a vacuum that could suck water from under the ground.

Unfortunately the machine had its limitations and wasn't able to suck up water from more than a 10 metre depth; quite useless in the deep mine shafts. So, Newcomen decided to create a better pump.

He didn't have any money, but luckily his religious contacts came to the rescue. John Flavel, a local Presbyterian preacher, had set out to help like-minded people. And in his benevolence, he lent Newcomen some money so that he could pursue his invention.

Over the next 10 years, Newcomen worked diligently to solve the mysteries of the steam engine. He locked himself in his cellar with his trusted friend and future business partner John Calley, a skilled plumber. Here, the two of them soldered, forged and turned as their machine slowly took shape.

Against Hooke's advice, Newcomen gave his steam engine a piston. It pushed up into the cylinder as steam rose from the boiler. When the steam was cooled with cold water, a vacuum was created and the piston dropped. With fresh steam, it was pushed back ►



**Invasive groundwater in the deep mines disrupted coal production and created difficult and dangerous working conditions.**



# The new pump led the way

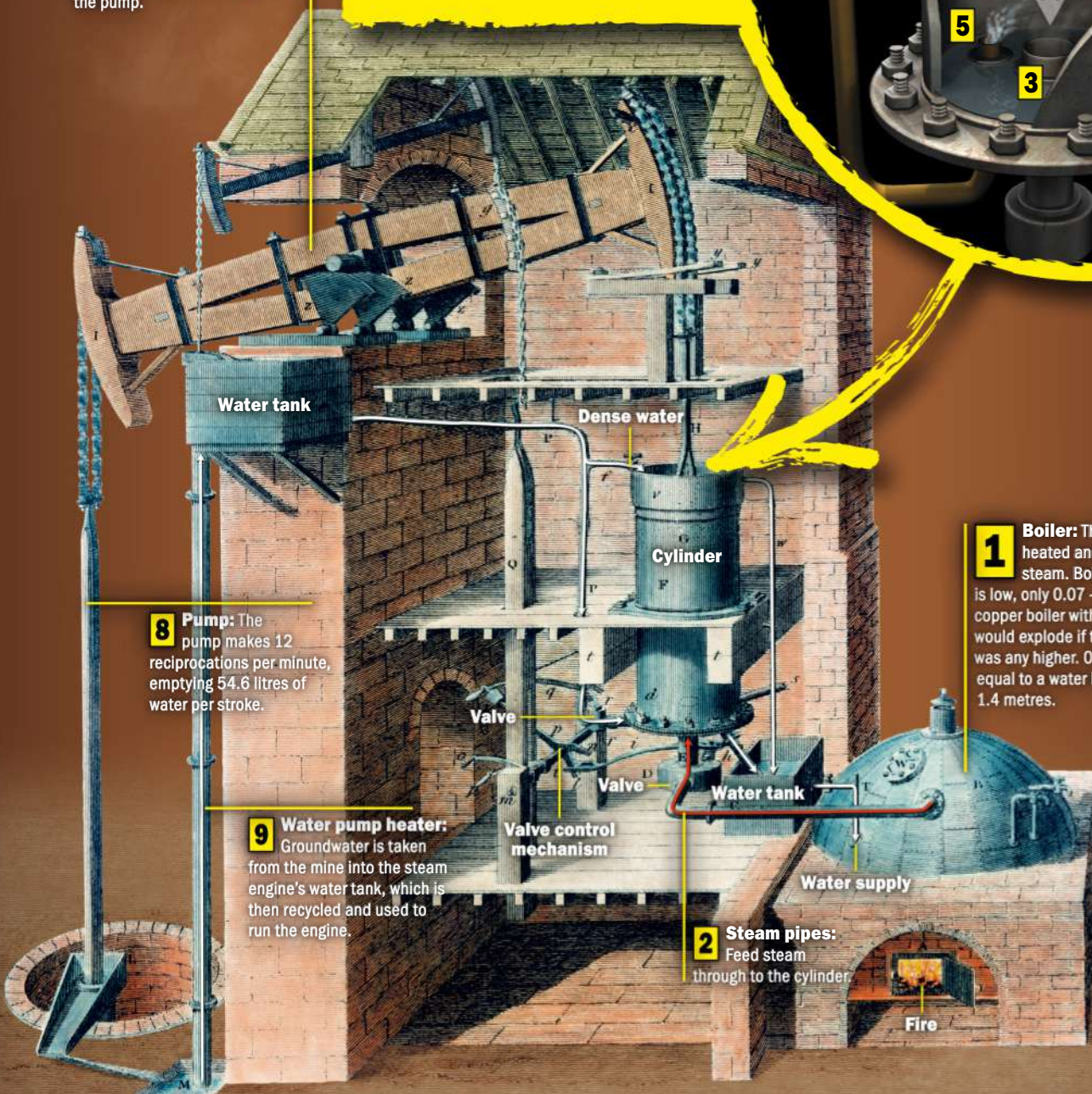
**Newcomen's steam engine was capable of pumping 39,312 gallons of water per hour. Pressure was created in its large cylinder, where the steam pressure and vacuum forced the piston to move up and down.**

JESPER ØSTERGAARD &amp; SCANPIX

## Cylinder provides power

- 3** The steam from the boiler comes through the bottom of the cylinder via a valve.
- 4** Pressure from the steam pushes the piston up.
- 5** Cold water is sprayed into the cylinder, so the steam turns into water, which rests at a lower level than the steam. The resulting vacuum sucks the plunger up.
- 6** The piston's movement is transferred to the lever.

- 7 Rocker:** The arm follows the piston's up and down motion and the resulting pressure is passed through to the pump.



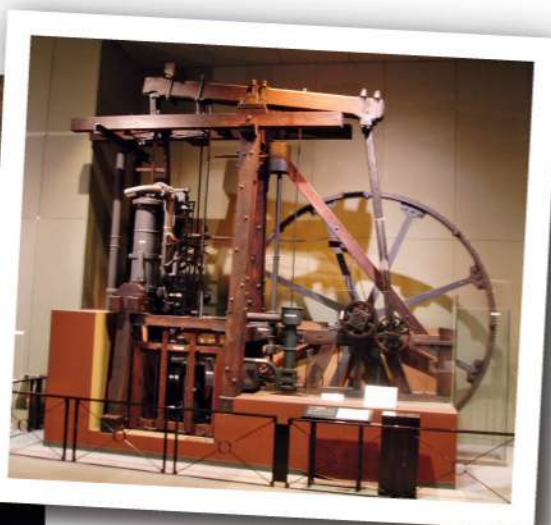
- 1 Boiler:** The water is heated and turns to steam. Boiler pressure is low, only 0.07 – 0.14 bar. The copper boiler with its lead lid, would explode if the pressure was any higher. 0.14 bar is equal to a water level of 1.4 metres.

- 2 Steam pipes:**  
Feed steam  
through to the cylinder

- 9 Water pump heater:** Groundwater is taken from the mine into the steam engine's water tank, which is then recycled and used to run the engine.

- 8 Pump:** The pump makes 12 reciprocations per minute, emptying 54.6 litres of water per stroke.





*Following Thomas Newcomen's initial breakthrough, James Watt was able to improve the steam engine by adding a rotating shaft that could drive a wheel.*

up again. As the machine chugged away it worked a lever that sat on top of it, and as the rocker arm moved to and fro, it emptied water from the pit.

It worked well in theory. Yet Newcomen had a problem. The steam didn't cool quickly enough, and because of this, the machine kept stopping. Newcomen and Savery splashed cold water onto the cylinder to speed things up, but it didn't solve the issue.

### **An accidental solution**

Newcomen scratched his head. This quandary wasn't going to beat him. He tried using a lead pot to cool the water by creating a jacket to wrap around the cylinder. It didn't look as though it would work, until by chance, an accident provided the solution.

The cylinder had a tiny leak. Newcomen had soldered it with tin, but the heat from the molten tin and the cold water flowed into the cylinder. As soon as the steam hit the water, the pressure fell with such violent force that the bottom of the pot broke smashing the boiler lid to pieces.

The sight of all the sizzling and spluttering, and the scalding water that splashed into the room, was a revelation to Newcomen. Nobody had ever considered spraying water straight into the cylinder, yet its effect was amazingly powerful.

Newcomen had solved the problem. By spraying cold water directly into the cylinder he could keep the machine running. The steam engine was installed in the coal mine at Conygree, where it

successfully kept the ground water out of the mines. Staff at the mine could breathe easy. Every day, 22,000 litres of water were pumped from the mine. The new invention was a phenomenon and it wasn't long before order books for the steam engine were full.

A report from the London Gazette, extolled, "What an invention. Any kind of pit can be drained and be water free: not by horse or hydropower, but by firepower. It's the ultimate in engineering perfection. Water can be pumped to any height, with ease and at a reasonable cost".

The newspaper directed potential buyers to the Sword Blade coffee house where, every Wednesday, Thomas Newcomen held court. It was brilliant marketing and within three years, Newcomen had more than 100 machines working in English mines.

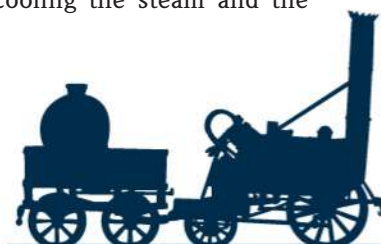
### **James Watt went one better**

Newcomen's engine underwent many improvements over the following years, both in terms of materials and specification. The cylinder was replaced with a more expensive copper and brass one and was also made larger so it was more powerful. The engineer John Smeaton streamlined the water cooling process with the addition of injectors.

Even with these improvements Newcomen's engine still had an inherent weakness: it wasted a lot of coal, stokers were shovelling more than half a ton every day into the fire under the boiler. Only one per cent of its energy was used to pump water, so

running the steam engine was becoming too expensive for the mine owners to justify. Many reverted to the old and familiar ways for taking the water out of the mines: horse and wind power.

The problem needed to be solved. In 1763, James Watt, a young Scottish instrument maker was asked to repair a model of Newcomen's engine at Glasgow University. Watt had never seen a full-size steam engine before. Yet even from his limited time working on the model, he realised that the engine was using far more fuel than was necessary. He quickly resolved the problem, identifying that there was an issue when the cold water was injected into the cylinder: the cold water was cooling the steam and the



*"A high speed train isn't possible. Passengers won't be able to breath and will die from lack of oxygen"*

Dionysius Lardner, professor and author of a book on the steam engine.



**2** The resulting vacuum was so powerful that a team of two horses couldn't pull the two hemispheres apart.

cylinder. Then the cylinder needed to be reheated and every time it happened, it was wasting coal. Watt put together an idea to overcome the problem and improve Newcomen's engine. He wanted to create an engine that was "cheap as well as good".

Watt spent months experimenting: testing out different materials; brass, cast iron, wood and seeing how they responded to being saturated in flaxseed oil and baked until they were dry. He even mixed cardboard with manure to see if that would work. But nothing solved the problem. The differences in temperature were still too high.

The Scot mused further, until one day the solution hit him right between the eyes. The steam had to transfer from the cylinder into another tank where it would cool. This way, the cylinder itself wouldn't cool and therefore it wouldn't need to be reheated. And as the new container – a condenser – would be connected to the cylinder, the vacuum effect would be preserved.

In January 1769, James Watt went to London to pick up the final proof that he had solved the problem – a patent named, "A method of lessening the consumption of steam in steam engines – the separate condenser".

### Steam-powered looms lead the way

Watt's idea could not have come at a better time. England was undergoing great change and the need for steam power was colossal.

The cotton was carded, spun and woven in peoples' homes and the income from it was a welcome addition for poorer families. New technologies made textile work more efficient, such as "the flying shuttle", a device that made it possible for a single weaver to produce wider pieces of cloth. The automatic spinning machine, patented by Richard Arkwright in 1769, also changed the face of the textile industry, helping it to grow. But without an engine to improve things further, the industry was stuck.

Although Arkwright's spinning machine helped to improve production, it was unwieldy. Originally it used horses to power the automation. That was soon replaced by hydropower. However, hydropower needed water to work so all of the mills needed to be sited by a river as the spinning machine needed a large mill wheel to power it. ►

**1** Otto von Guericke put two hemispheres together and then sucked out all of the air.

## Acceptance of vacuum took 1,650 years

**For centuries, a scientific belief – which proved incorrect – stood in the way of the development of the steam engine.**

**B**y the time Newcomen started his research, other people had already been experimenting with the potential of steam.

In 60 AD, the mathematician Heron of Alexandria developed a device that ran on steam. It consisted of a hollow sphere mounted on two dies sitting diametrically opposed to each other bending in opposite directions. The sphere was placed on a shaft and connected to a water tank by two further tubes. When the water boiled, steam moved through the tubes into the ball and out through the nozzles. The steam pressure caused the sphere to turn. While Heron's invention created much amusement among his peers, it never had any practical use.

Steam pressure was fine, but without a vacuum, a steam engine wouldn't work: the vacuum was the key to a workable steam engine and scientists hadn't yet reached this conclusion thanks to one man.

Greek philosopher Aristotle, regarded as the father of Science,

denied the existence of a vacuum chamber. And no one dared challenge his authority. He hadn't actually experimented with the idea, so his conclusion was based solely on theory and formal logic.

It wasn't until the 1600s when people started experimenting more, challenging a theoretical approach to science, when concrete research began into vacuums. In 1644, Italian physicist Evangelista Torricelli described a vacuum in a glass of mercury. He was forced to halt his research, however, when his observations were met with hostility from both his peers and the church.

Three years later, German Otto von Guericke was convinced of the existence of a vacuum. He sucked all of the air from two linked hemispheres. The void between the two hemispheres created a vacuum that held them together; two horses couldn't pull them apart. It seemed like another party trick, yet, shortly afterwards, along came Newcomen, giving the vacuum a practical use.





Coal-fired steam engines emerged in industries across the world.

SHUTTERSTOCK

## The development of steam

**1712** Thomas Newcomen invents a steam engine to **pump water** from the Conygree mines in Dartmouth, in England.

**1769** James Watt patents a **more efficient** steam engine.

**1783** James Watt constructs a steam engine that turns the piston's up and down movement into a **rotation**. The machine can drive a wheel, making it perfect for use in the country's growing industrial age.

**1807** American inventor Robert Fulton's steam boat *Clermont* steamed from New York to Albany.

**1808** Richard Trevithick shows an early **locomotive** in London.

**1829** George Stephenson builds his steam locomotive, **Rocket** for the Liverpool & Manchester Railway.

**1859** The first **steamroller** is built in France, significantly improving road construction. The last example in the UK worked until the 1970s.

That caused problems. There weren't that many suitable riverside sites to turn into mills and the sites had to be linear; they couldn't be grouped in a town or city. It also upset the mill owners. Their mills were often many miles apart. Arkwright was a mill owner and his mills were sited between Manchester in the North West to Glasgow in Scotland.

The advent of the steam engine meant this would soon change, however. Newcomen's engine could make up and down movements with its rocker arms and this was sufficient to drive a mine pump, but not enough to drive the wheels of a mechanical spinning machine. In the first instance the mill owners solved the problem themselves using the steam engine to pump water from the mill pond over a mill wheel and in turn that drove the spinning machines, but it wasn't ideal.

James Watt had a better solution – a rotating shaft – that enabled the steam engine to drive the wheel. This resolution gave the engine a considerably greater scope. The demand for cotton fabric escalated – from £5m

in 1781 to £31m in 1790. Soon the sound of mills, humming, squealing and steaming could be heard everywhere across the country's rapidly growing factory towns, while the new spinning machines were churning out roll after roll of cotton. Watt and his business



*"There will come a day when people will travel in steam-powered vehicles, almost as fast as a bird can fly, at 25-30 km/h."*

Oliver Evans, American inventor

partner Boulton produced of a total of 496 steam engines. They drove 164 pumps, and operated the machinery in 308 mills, while the remaining 24 were operating in steel mills.

### Steam brought the world together

Pumps and spinning machines were only the beginning. The popularity of the steam engine was growing and it started to be used in more and more countries, within a number of different industries. You could find them in sugar mills in the Caribbean, grain mills in Europe and copper mines in America.

It enabled iron foundries to grow as the bellows, powered by steam, supplied the raw materials for the machines that powered the wheel's of industry.

The introduction of steam power increased production and as production grew, the need for transportation increased too. Crude goods such as coal and cotton had to be brought to the factories, and the finished products were sent to warehouses or directly to the customers. Until now, boats and primitive horse-drawn railways had been responsible for this job. Now steam was at the forefront.

Additional pressure to the steam engine came from Richard Trevithick, who built the first locomotive. The invention was later refined and popularised by George Stephenson, an English engine builder who had learned his trade on steam engines – as had Newcomen – in a coal mine. Stephenson was the man behind the world's first passenger railway, the Liverpool & Manchester railway, and the first working locomotive – the Rocket.

Over the following years, railways replaced canals – not only in Britain, but all over Europe. And slowly but surely the rest of the world embraced the railway too.

With a new industrialised world, people had an opportunity to move about more freely. For the first time, post moved between countries, people travelled the oceans and it became much easier to communicate between countries and even continents. Yet, an old fashioned sailing ship would take several weeks to cross the Atlantic and this simply didn't suit the modern age. Then, along came the steam engine. In 1807 Robert Fulton's steam boat *Clermont* steamed down the Hudson





BLACK COUNTRY LIVING MUSEUM

**There's a replica of Thomas Newcomen's steam engine on display in the Black country museum.**

River at a rate of 8 km/h. In 1838, *Sirius* was the first steam ship to dock in New York after crossing the Atlantic. One hundred years later, the British steam ship, *Queen Mary*, crossed the

Atlantic in just three days, 21 hours and 48 minutes. The industrial age had become a reality.

Thomas Newcomen and his achievements have long since become a thing of the past. Although his steam engine paved the way for a generation of innovation, and was still in operation pumping water into a canal in Coventry until 1913, few people remember his contribution to the history of the steam engine.

In its last years of production, Newcomen's steam engine sales were handled by a company with the obscure name, "Holders of the invention of how to pump water through fire". It didn't really acknowledge the major impact his engine had made on the industrial age. Newcomen himself lived and died in

relative obscurity. In 1729 he was buried in Bunhill Fields, a cemetery in North London, but his grave no longer exists. Newcomen was never honoured in life and no monument bears his name. Yet, one of his steam engines can still be found in his home town of Dartmouth: a reminder of its creator and his importance. The engine is still in perfect working order. ■

#### FURTHER READING

- William Rosen: **The most powerful Idea in the World. A Story of Steam, Industry and Invention**, Random House, 2010
- Richard L. Hills: **Power from Steam**, Cambridge University Press, 1989
- Jenny Uglow: **The Lunar Men. The Friends who made the Future**, Faber & Faber, 2002



SCANPIX/ANG IMAGES & BROCKMAN

**Black coal smoke darkened the skies over Manchester for many years.**

# Steam drives people to industrial towns

**Steam engines transformed England's landscape at an explosive speed as people moved out of the country and new cities arose.**

The invention of the steam engine created factories, trains and ships, as well as new modern cities. The new steam-powered factories lured people in large numbers from rural to urban areas. During the 1800s British towns like Manchester, Glasgow, Sheffield and Newcastle grew exponentially.

In 1800, Manchester only had 10,000 inhabitants, but 53 years and 108 new textile factories later the population reached 186,000.

Life in the cities was ghastly. Workers lived in small, overcrowded apartments without the most basic

sanitation. Illness and disillusion prevailed and people drowned their sorrows in the many small pubs that were a regular part of the large urban landscape. Most noticeable across the cities was the pollution.

"A black smoke covering the city: the sun hidden from sight. Busy machines, grinding wheels, the screeching sound of steam and the rhythmic sound of the looms are the only sounds you cannot escape in these dark, half-lit streets," wrote French historian Alexis de Tocqueville about Manchester in 1835.

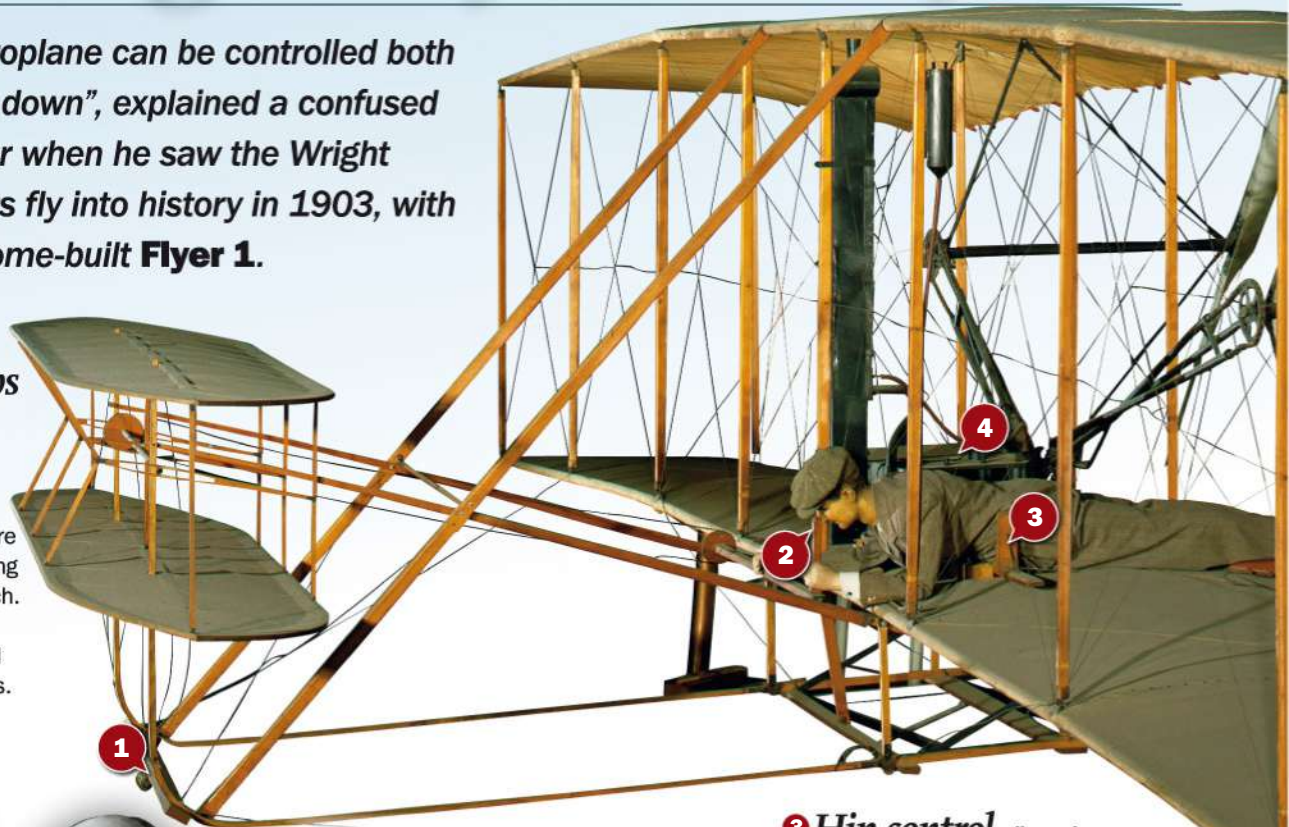


# Wrights' first aeroplane

BY MORTEN RENDSMARK  
 "An aeroplane can be controlled both up and down", explained a confused reporter when he saw the Wright brothers fly into history in 1903, with their home-built **Flyer 1**.

## 1 Hub caps

mounted under the plane made it possible for Flyer 1 to glide along an 18 metre track to its landing spot on the beach. Speed and headwind moved the aircraft wings.



## 2 Steering

helped the Flyer 1 rise or fall. The brothers used wing-warping for lateral control, a control stick to move the rudder on the wings and an elevator for pitch control, fitted in the nose because they believed it would protect the pilot if the plane crashed.

## 3 Hip control

allowed the pilot to turn the plane right or left, moving his hips inside the wooden frame, which was connected by wires to the wingtips. It would tip one wing up and the other one down.



POLFO/ORBIS

## From bicycle shops to aircraft pioneers

1896

### German inspiration

Brothers Wilbur and Orville Wright owned a bicycle shop in Ohio, USA. Neither was educated, but read with excitement about the German Otto Lillienthal's flights with kites and gliders. The brothers were convinced that a plane with an engine and a pilot would be able to fly. Development work started.

1899

### Wing-warping tests

The brothers built a bi-plane, braced with steel wires that crisscrossed between vertical wooden struts. They showed how the wires between the wings could be twisted, warping the wing structure to create lift and balance, a concept they called wing-warping. The idea for it came from studying birds in flight.



POLFO/ORBIS

### Wind tunnel

The brothers worked systematically to build over 100 different blade models that were tested in history's first wind tunnel – a wooden box with a motor-driven fan at one end. Model wings were hung inside the box and through a glass window, so the brothers could see how the wings responded in the wind. After all, aviation was science rather than reckless adventure...



1901



**5** *The propellers* were two, slow-turning, large propellers. The thin wooden blades served as rotary wings to give the aircraft horizontal thrust.

5

**4** *The engine* was located next to the pilot. It had four petrol powered cylinders, weighed 77 kilograms and provided 12 horsepower. It was cooled by water from the elongated tank between the wings. The petrol tank hung over the engine.

**Instruments** — Wright's *Flyer* had three: a stopwatch noted the duration of the flight, a tachometer measured how many times the crank-shaft spun per minute, and an anemometer measured both wind speed and the distance that the plane flew.

## WHO FLEW FIRST?

\* In 1848, Briton John Stringfellow put a motorised, unmanned aircraft in the air. It was propelled by a three kilogram steam engine, hanging under the plane. It flew 10 metres, after which the aircraft was stopped by a net.



\* In 1874, French Felix du Temple de la Croix ran his motorised plane down a ramp. The plane took off for a few seconds, but the trip was more of a free glide than a flight.



\* Some historians believe that the Frenchman Clément Ader was first to fly a motorised aircraft. Ader developed a plane with a propeller and bat-like wings that was powered by steam. Ader claimed that in 1890, he flew 20 centimetres above the ground for 50 metres.

\* According to eyewitnesses, New Zealander Richard Pearse flew in March 1903. He didn't have the energy to complain when Wright was honoured as first in the air.



### Glider flies 190 metres

Wilbur and Orville Wright built a number of manned gliders. They tested their designs in the beach area of Kill Devil Hills, south of the small town of Kitty Hawk, North Carolina. They made at least 700 test flights. On the longest manned mission their glider flew 190 metres. The brothers were satisfied with the shape of the blades and discovered that a rudder gave the glider greater stability. The next step was the propeller.

1902

### An engine with wings

They couldn't use car engines from the day, so the brothers developed a small self-sufficient engine. The Wrights then travelled back to Kill Devil Hills, where they picked up the 318-kilogram aircraft.

On 17th December, everything was ready to go. The brothers flipped a coin to see who would be the pilot. Orville won the toss and flew through the air for 12 seconds. The plane was so slow that Wilbur ran alongside. Later, Wilbur flew for 260 metres, remaining in the air for 59 seconds. History's first manned and powered flight was complete.

1903



NATIONAL AIR AND SPACE MUSEUM





# A new Ford every 9 sec

*Henry Ford's cheap Model T was so popular that the factory could not possibly keep up with demand. Traditional automotive manufacturing techniques was too time-consuming, so Ford introduced a completely new production method that meant customers could all have a new car. Ford met the demand and put the world on wheels.*



## DETROIT/1913

Its location on the busy waterways of Lake Erie and Lake Huron has made Detroit a transport hub. After the car is invented, many coachbuilders start to convert from manufacturing horse-drawn carriages to cars.



***At its peak, Henry Ford's assembly line workers built nearly 10,000 cars in a single day.***

MARY EVANS

# onds





On 1st October 1908, a major newspaper in the United States published a full-page ad for a new car, it made the readers smile. The ad presented the Ford Motor Company with a vehicle that was not only “powerful, speedy and enduring”, but also so cheap, one that “every man with a fair income could own”. The car was a Model T and its \$850 asking price – a teacher's annual salary – was unheard

of for an automobile. The ad stated that the Ford would be affordable for all and everyone would “be able to enjoy with his family, the blessing of hours of pleasure in God’s great open spaces”.

At a time when the car was a toy for the rich, the ad made no sense to most. They had not even thought about the idea that they would ever own a car. No one could even suspect that the ad was a sign of new times and that Henry Ford’s “4-cylinder, 20-horsepower, five-

passenger” family car was on the way to revolutionise the world.

### Cars off the shelf

Even as a boy, Ford had been bitten by the mechanics bug and toyed with the insides of watches. As an adult, he was a seasoned racer and had built several cars in his workshop. But Ford’s greatest dream was to make a motorised vehicle to sell off the shelf. Ordinary people should be able to buy a car in the same way they could go to a shoe shop to purchase shoes, he said.

Ford stood alone with his vision. The automotive industry was still in its infancy and no other manufacturers could see the point of a car for the masses. But Ford was stubborn. He insisted on putting the world on wheels, and when he launched the Model T in 1908, Ford was hoping to bring US roads to life.

Compared with the splendid luxury cars already on the market, the Model T was a tiresome lump of metal, a box on wheels, a mechanical workhorse without any frills. But what it lacked in beauty, it made up in other areas. The engine was reliable, the mechanics were easy to repair and the car was so robust that it could keep a good course along bumpy roads in the tracks of the day’s most widely used carriages.

### The factory drowned in success

Despite the car’s obvious qualities, Henry Ford’s competitors agreed on one thing: it did not make sense to produce a cheap car. Only rich people bought cars. Therefore, his rivals confidently predicted that Ford’s vehicle would be history within a year. They would quickly prove to be mistaken.

Henry Ford had captured the zeitgeist and hit the mark with his gamble: Americans loved cars – especially cheap cars – and the minute the Model T entered the market, impatient souls stood in line waiting for their turn at the wheel.

The demand came as a surprise to everyone – even Ford, who had probably been hoping for success, but not to that extent. The orders poured in quicker than his factory could produce cars. The problem was that “the tin Lizzie” – as the car was called – took a long time to

## A patent war made sure Ford's name was known

**By 1895 an inventor had already obtained a patent to make cars in the US, but it was too broad for Henry Ford, who appealed.**

Who owns the rights to build cars? At the beginning of the 1900s, the question sparked a lengthy dispute between Henry Ford and inventor George Selden.

Without having built a single car Selden succeeded in patenting the basic construction in 1895. The patent was so broad that it included an internal combustion engine and also the use of four wheels. In short, he owned the sole right to produce cars in the United States. The patent

was highly profitable for Selden, who made a fortune selling licences, including to Henry Ford.

But Ford and four other car manufacturers contested Selden’s right, and in 1903 the two parties met in court for the first time. The case had massive press coverage, and where Ford had been previously unknown, his name was suddenly on all Americans lips. Initially Ford lost to Selden, but the case was appealed and ran through the courts for eight years. The court files ran to 14,000 documents and Selden finally lost the case in 1911.

As Henry Ford launched his Model T, Selden’s name had already been written out of automotive history. Thanks to the trial, Ford and his family car received lots of publicity, saving him a fortune on advertising.

George Selden

*In the car's infancy, Selden had the patent to produce automobiles in the United States.*

AOP/GETTY IMAGES

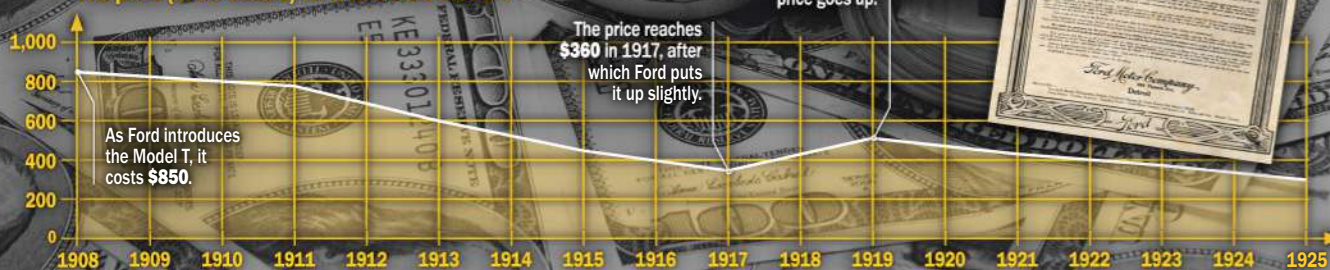


## The price goes down

The introduction of the assembly line had an enormous impact on car production. Ford could produce the Model T quickly, in huge quantities and at a low price.

After WWI, sales gain momentum and the car's price goes up.

The price (in US dollars) for a new Ford Model T



build. Each part was prepared separately and fitted using various tools, and the process was extremely time-consuming as a Ford car consisted of about 5,000 parts when screws, nuts and all other small components were included.

At the factory on Piquette Avenue in Detroit, almost 2,000 workers pored over the vehicles, and the work was carried out the in same way as the work on any other car in the fledgling automobile industry: built one at a time in the same physical spot throughout the build, while workers ran back and forth to retrieve parts. But even working around each other in this way, Ford workers hand-built 10,607 copies of the Model T in 1908.

Henry Ford was far from happy, however. With order books bulging, he had to turn customers away, and Ford feared that the thousands of impatient people on the waiting list would walk away from Ford and buy a horse instead.

Initially Ford solved the problem by moving production to his newly built factory in Highland Park on the outskirts of Detroit in 1910. It spanned an area of 14 hectares – about 30 football fields – and housed over 4,000 employees, and became the world's largest car manufacturer.

### Ford makes more and cheaper cars

Sparkling new Ford cars rolled out of the building in lines, and each year from 1910 to 1913, production doubled. In just one day during 1911 the plant built 1,300 cars. Although other American car manufacturers looked on with both amazement and envy, it still wasn't good enough for Ford.

The factory still couldn't keep up with demand, so Ford devised a plan to speed up production without any more staff and without sacrificing quality. In return he intended to lower the price of

the car further, so even more customers could afford to take to the road.

From the moment the Highland Park factory was operational, Ford had kept a keen eye on the manufacturing process. Everything had to be optimised, wasted time needed to be eliminated, and he hired a number of consultants with expertise in streamlining to help implement the new process.

With a stopwatch in one hand and a pencil in the other, the experts timed each process and noted every movement made by each worker. The measurements revealed that the staff wasted precious time going back and forth between the assembly hall and warehouse to pick up components, and it irritated Ford. He did not like to pay wages for what he described as a "walking sport". Instead, people should stay on the spot.

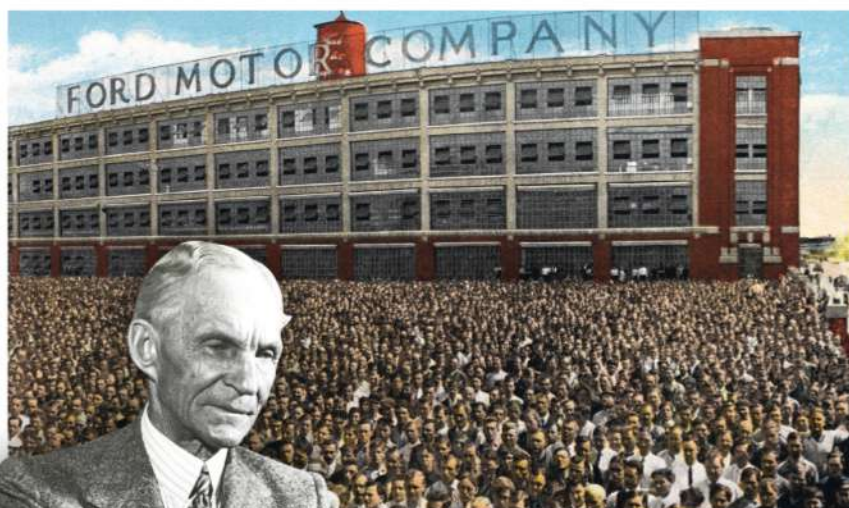
"The work should come to the worker, the worker should not go to the work", was his mantra. Ford's vision was to mass-produce cars, and an

important step in the process had been found: simplify the workflows.

"A man should never go more than one step if it can be avoided, and no man should ever need to stoop", wrote Ford on the main principles of the production that he intended to introduce.

### Munitioneer was inspiration

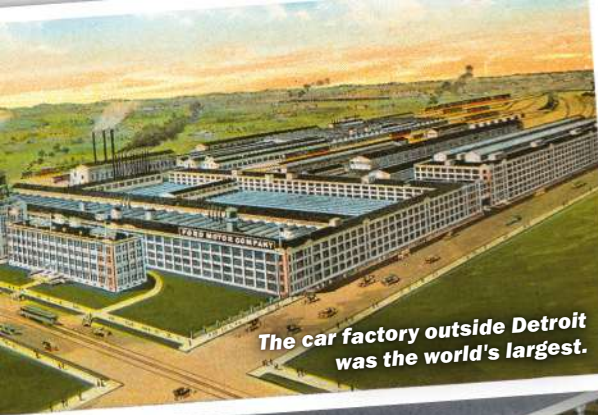
Mass production was not a new phenomenon. As far back as 1798, one of Ford's countrymen, inventor Eli Whitney, had been the first in the world to start producing firearms on a large scale. Whitney had received an emergency order of 10,000 muskets for the US Army, and rather laboriously started to build each rifle by hand. Whitney developed machines that could produce identical copies of the weapon parts. This allowed him to meet the tight schedule, and as a side benefit components could be easily replaced if they broke. Whitney's system served as a model for other weapons factories, ►



Henry Ford

As Henry Ford put wages up while reducing working hours, thousands of people flocked to the factory in Highland Park looking for work.





The car factory outside Detroit was the world's largest.

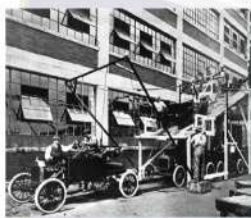


**2** Body parts are painted and dried in large ovens.

**1** Fuel tanks are assembled and tested in water tanks.

**9** Cars are assembled and taken away.

Cars to be taken by train to dealers are fitted outside the assembly hall.



POLOTO/CORBIS

## The assembly line brought the work to the worker

**The assembly line ensured that workers did not have to waste time getting car parts from the warehouse. It made the plant more efficient.**

**F**ord created a large-scale industrial product. On the assembly line, the parts arrived at each of the assembly steps. Each worker had a single specialised task such as fixing a wing. All of the fixing arrived at his work

station, where he'd fit the part and then the car would move along the belt to the next station and the next part of the process. Optimisation of the assembly line meant the factory could produce up to 10,000 cars in a single day.

**4** The chassis is assembled and the motor mounted. Workers have chains to help hold the heavy motor in place.



POLOTO/CORBIS

and during the 1800s, other industries took up the idea for themselves. Watches, sewing machines and typewriters were among the numerous products that were mass-produced.

So far, no one had attempted to mass-produce cars, but Henry Ford had a plan. At a slaughterhouse in Chicago, he had seen how the animals were cut up and packed on a moving belt where specialised workers stood at a fixed

location and performed specific tasks. Assembly lines were based on an idea from 1787 when miller Oliver Evans invented an ingenious system with a chain of buckets that fed grain all the way through the mill, where it was ground by machinery before it came out as flour in sealed bags.

Ford thought that the idea of the assembly line was ready to transfer to the factory. In his mind's eye he saw

endless rows of Model T cars rolling off the assembly line. And it was no sooner said than done: in the spring of 1913 Ford, together with the engineers in Highland Park, began to manufacture coils for the car's flywheel – part of the engine – on an assembly line.

At the time, one employee would take 20 minutes to produce one coil,





but now the work was split into 29 working procedures carried out on a power-driven belt. The result was impressive: the initial test showed a reduction in time to 13 minutes and after that the engineers had fine-tuned the assembly line's speed and elevation to bring it down to just four minutes. The Ford factory could now produce five cars in the time it previously took to make one. Uplifted by this success, Ford

decided to try elevating the car's chassis to build it on assembly lines. He let two men pull the chassis through the factory on a rope, from one group of workers to the next, until the car was finished. The trial was immensely promising, and when Ford replaced his human guinea pigs with mechanical pulleys, the gain was enormous. Previously, it took 12 hours and 28 minutes to assemble a chassis, but the first, imperfect

experiment demonstrated that the production time could be pared down to five hours and 50 minutes.

### The assembly line rolled on

Ford had hit on something big and introduced the principle to the whole factory. Every production department was divided into small subsections, each with its own assembly line and associated synchronised feed lines ▶



# Ford's dealer-concept was a prototype for Burger King

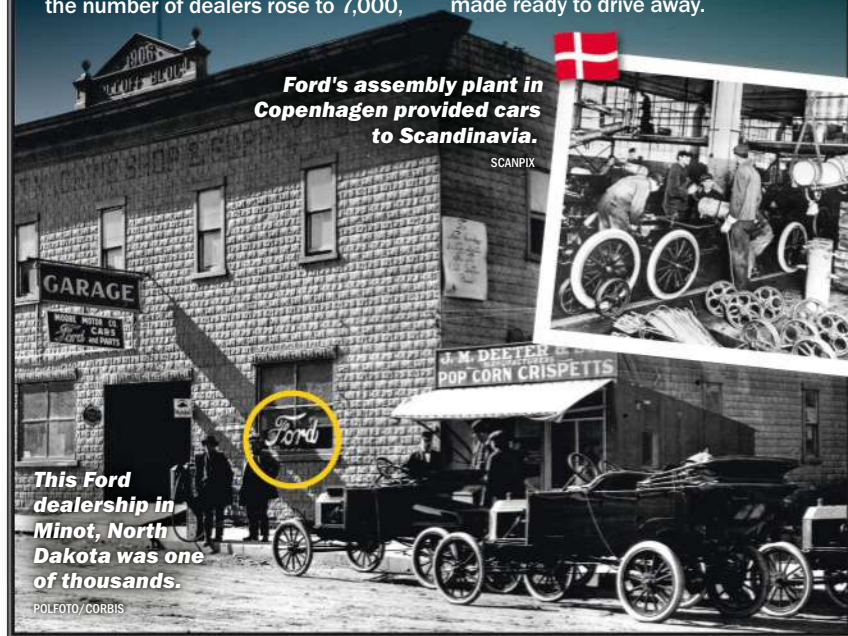
The Model T could be bought anywhere, but Ford didn't sell them to the public. Instead, he let others pay for the right to sell the Model T.

Henry Ford was one of the first in the history to establish the franchise system that we know today from companies like Burger King. Independent retailers pay for the right to exclusively market a particular product.

At the launch of the Model T, Henry Ford had created a network of 10 dealers who bought the rights to sell, exhibit and service the car. But from the beginning, his goal was that every city in the US with a population over 2,000 should have a Ford business and his ambition came true. In 1912, the number of dealers rose to 7,000,

and customers were never in doubt that they were in a Ford store. Ford had been quick to establish a recognisable logo and brand, which was consistently used across cars, ads, billboards and other promotional materials. Ford kept a close eye on his dealers and they might be visited by inspectors at any time, checking that the shops were in order and that customers received good service.

Ford's global network also included assembly plants, which received the components in crates and where the cars were assembled locally and made ready to drive away.



supplying the right parts to the worker at the right time. Along the belt, various work stations were set up and the man who, for example, set a bolt in the chassis, did not put on the nut. The task was entrusted to the next man on the assembly line.

The result was dramatic: from the initial production time of 12 hours and 28 minutes the process was cut down to just 93 minutes. In 1913 factory production quintupled and put 168,220 new cars on the road. The following year, which was the first year in which

the assembly line was fully operational, the figure reached as many as 248,307 cars. Henry Ford had started a new industrial revolution. Thanks to the assembly line, he could produce a superior product at a cheaper price on an unprecedented scale, yet earn more from it.

## The customer could choose black

"Every time I lower the price of our car by a dollar, I get a thousand new customers", Ford claimed. Using cost-cutting measures, he brought price of a

Model T down from \$850 in 1908 to \$430 in 1915. One way he was able to cut costs was by reducing the choice of colours to just one: black, because black paint dried faster than other colours.

"Any buyer can have a car in colour so long as it's black", Ford had declared, and the millions of people who were privileged enough to get their hands on a Model T were happy to oblige. Black cars were sold to customers as a benefit and they lapped them up. As Henry Ford had hoped, the roads throughout the US and Europe started to fill up with cars, most of them Model Ts.

## Workers hated the assembly line

Henry Ford was happy, and the customers were satisfied. But among the workers at Highland Park, there was simmering discontent. Work on the assembly line was monotonous and as the stressful pace was increased the noise was nerve-racking.

Previously, workers had been proud when a car they had built from the ground up rolled out of the factory, but now the job satisfaction had gone. No one could feel content standing and doing the same thing day in and day out. It was a laborious routine, where the worker used neither muscle nor brain. But in Ford's eyes, there was no problem.

"I've heard factory experts say that monotonous work breaks down the body and soul. But despite the most thorough investigations, we have not been able to find a single case in which a working soul has been weakened by this kind of work", he claimed. "The thing is that for many people it is a terrible idea to be forced to think".

Ford was also convinced that work should be solely focused on getting the job done and being paid for it:

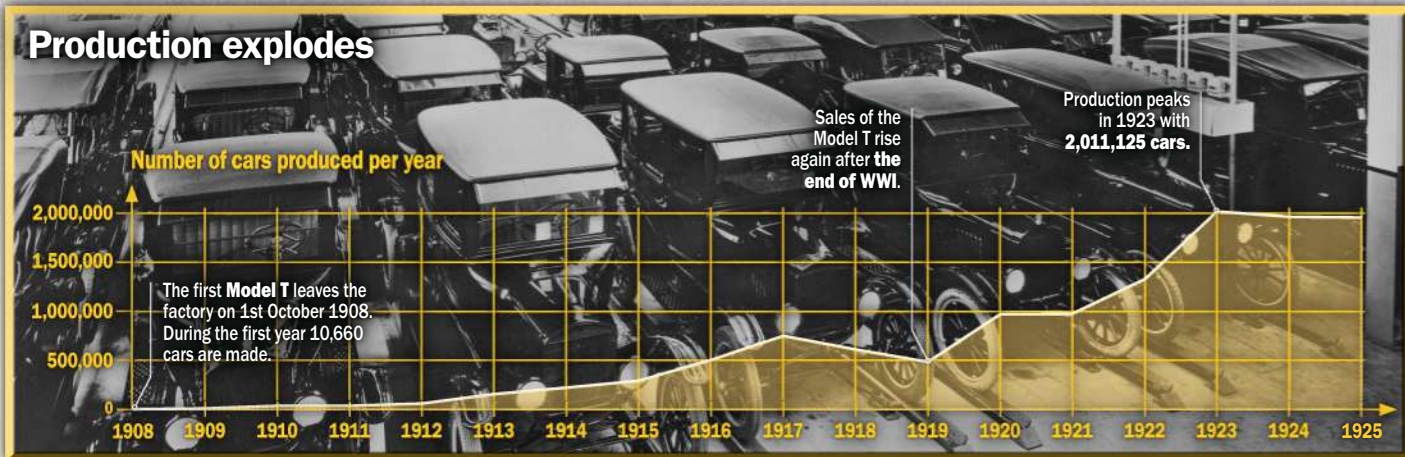
"When we work, we should work. When we amuse ourselves, we should enjoy ourselves. But it does not make sense to mix the two", he argued.

The men on the factory floor didn't share his attitude: as professional pride in their work disappeared. Following the introduction of the assembly line, many left work within months of switching. This turnover started to have financial repercussions.

For every 100 people Ford needed, he had to recruit 900 annually, and



## Production explodes



since it cost \$100 to train an employee, Ford had to fork out a considerable amount of money. However, he found an unconventional solution: on 5th January 1914, Ford more than doubled the workers' daily wage from \$2.34 to \$5. At the same time he cut one hour from the working day, bringing it down to eight hours.

Ford's changes sent shockwaves through US industry. Five dollars was an unprecedented high wage for unskilled labour and while other business owners criticised Ford, calling him a traitor, the financial newspaper *The Wall Street Journal* predicted that Ford, with his "misguided gesture" had put a bomb under the whole economy.

The financial world criticised him, but to the workers he was a hero. Staff at the car plant cheered, and people flocked to Highland Park in search of jobs. In front of the factory, tens of thousands of people pushed each other to get to the front of the queue, and while police made no effort to prevent it, panic ensued and factory guards had to spray people with fire hoses before they trampled each other to death.

Ford thought that it was the wisest decision he'd ever made. Workers' talk about organising a trade union stopped, productivity increased as Ford built more cars than all of the other manufacturers combined, and employee resignations ended abruptly.

Moreover, money continued to roll back into his own pocket, just like Henry Ford had predicted. Like everyone else, factory

workers had the burning desire to own a Model T, and now they could suddenly afford to pay for the previously unattainable dream of a car. Ford had created a middle class and helped it grow by continuing to lower its price. In 1925, the car was available for \$260 – less than a third of the price in 1908.

### Gigantic factory set a new record

In 1919, demand was such that Ford opened another factory. He was tired of suppliers that could not keep up with the pace of the factory, so he would produce all the parts for the Ford T too.

The factory was designed to match Ford's vision of bringing the work to the worker, and 43 km of assembly lines wound through it. The factory set new records for mass production, and in 1923, annual production of the Model T reached up to 2,011,125 cars. Two years later, the factory set another record as, in a single day, 9,575 shiny new cars rolled off the assembly line.

Henry Ford's vision had set the industry alive, and it was developing rapidly. He was the richest man in the world, and his industrial empire was the

world's biggest. Rather than thinking ahead, he continued to focus on the now very aged Model T. He refused to acknowledge that times had changed, and a new generation of drivers had arrived. They would rather have a smart Chevrolet than a Model T and in 1927 "Chevy" overtook Ford as the top-seller the United States. Ford had to realise that an era had ended, and in 1927, 19 years after its launch, the last Model T – number 15,007,033 – rolled off the assembly line.

In European assembly plants, production continued, but while the Model T headed towards the car cemetery, the technique that had made mass-production of cars possible was here to stay. Assembly lines rolled out across the world, and Ford was the man who had put the world on wheels. ■

### FURTHER READING

- Lindsay Brooke: *Ford Model T – The Car that put the World on Wheels*, Motorbooks, 2008
- Victor Wilfred Page: *The Model T Ford Car – Its Construction, Operation and Repair*, Norman W. Henley Publishing Co., 1916

**Henry Ford took a ride in the Model T number 15,000,000 with his son Edsel at the wheel.**

POLFO/ULLSTEIN BILD





**IMPORTANT  
BATTLES**

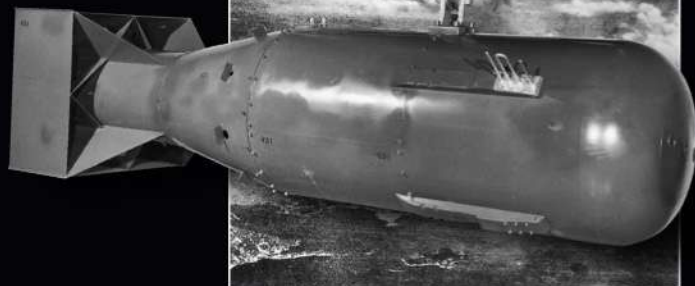
# WARS' TURNING POINTS

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During the Battle of Hastings, Norman knights captured England from the Saxons. At the Battle of Gettysburg, the North repelled the South in the American Civil War, and dropping the atomic bomb on Hiroshima broke Japan. A single action can reverse years of conflict and end a war.

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## ENGLAND/1060s




The English king, Edward the Confessor died leaving no sons. His death plunged England into chaos as several men wanted to take the crown from newly appointed King Harold. In northern England, Norwegian Vikings tried to take the throne, and from the south, the Norman army arrived.

*In the autumn of 1066, Duke William of Normandy crossed the English Channel with an invasion force of archers and knights. Soon the English King Harold had to fight for his life as one of history's most significant battles broke out at Hastings.*

*In the year 1066, England's  
fate was decided at the*

# Battle of





*After the Norman invasion in 1066, England was never conquered by a foreign power again. The victory gave William the nickname "the Conqueror" – he was previously known as William the Bastard.*

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### The Norman army

led by Duke William, who thought he had been promised the English throne. The army consisted of about 7,000 men from Normandy and Brittany in northern France.



### The English army

was led by Harold, the new king of England. The army was about the same size as the Norman one, made up of Anglo-Saxons and descendants of Danish Vikings in England.



# Hastings



A pale moon hung over the fields of Hastings in southern England. In the camp everything was quiet, except for the priest's voice softly chanting familiar words in Latin. Kneeling, Duke William of Normandy received sacrament. Then he stood, tall and straight, and carefully hung his relics of saints' bones around his neck. He was ready. Meanwhile the day was dawning, 14th October 1066.

With his invasion force of 450 ships and 7,000 men, Duke William crossed the Channel to challenge England's King Harold and take his power away from him. A coup was always a risky matter and navigating the channel with the army and horses only made the endeavour more difficult. Once his presence became known, English ships would block the shipping route. So 38-year-old William knew that from now on he had only one option: to win.

But William was accustomed to fighting. Son of the Norman King Robert



POLITICO/CHRIS

**William was from Normandy in northern France and so far had only been a guest in England, but at the end of September 1066, he arrived for battle. Ready to win – or die.**

I and his mistress, the tanner's daughter, Herleva of Falaise, he was labelled as "William the Bastard". When he was only seven years old, he inherited the title from his father and had to fight

hard to keep it. The country's great men tried to push him aside, and after numerous assassination attempts William had to go underground. As a young man he returned, eager to regain

## There were three battles in 1066

**The year 1066 was important in English history because three battles in just over four weeks decided its future.**

MIKKEL JUUL JENSEN

**1 BATTLE OF FULFORD** was fought between English earls and Norwegian Vikings led by Harald Hardrada, who attempted to overthrow Harold on **20th September**. The Vikings won.

**2 BATTLE OF STAMFORD BRIDGE** was fought shortly after **25th September**. King Harold fought against Harald Hardrada and his own brother Tostig Godwinson. Harold won, and both Tostig and Harald Hardrada were killed.

**The Scandinavian Vikings' dream of the English throne died at Stamford Bridge.**

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lost ground from both the nobles and the French king. William fought back and soon acquired a loyal following by always taking the lead in battle. He consolidated his power by building castles around his possessions. At only 19 years of age he saw his enemies defeated, which in turn guaranteed the Duke his position.

#### **The Duke was deprived of the throne**

The small duchy was not enough. William directed his gaze toward England and in 1051 at the age of 23, he visited the country and the king, Edward the Confessor. William was lead to believe that Edward had promised him the English throne as Edward, who was William's cousin, had strong links to Normandy. The country was, like England, populated by many descendants of Scandinavian Vikings.

On 5th January 1066, King Edward died, leaving no heirs. The next day, English nobleman Harold Godwinson was elected and quickly crowned his

*After their victory, the Normans took over most of the country. The Domesday Book shows that William was a zealous tax collector.*



successor – William's claim had been rejected in favour of the powerful English earl, who had built up his power during the 1050s as the king became increasingly frail.

At the time, England was a patchwork of small regions – districts – ruled by earls, some of whom were very powerful. This was especially important to the Godwinson family as William and his Normans were a huge threat to them and the country.

#### **Vikings in battle for power**

At the time, England was considered to be a stable society. Fertile farmland provided enough food for everyone, and compared to other

European countries the people, both men and women, enjoyed a high degree of freedom and equality. But Edward's death threw the country into turmoil with other people as well as William wanting to depose the newly crowned Harold. Harold's own brother Tostig sided with the Norwegian Viking king Harald Hardrada in a bloody coup to seize the English throne.

When William arrived in September 1066, there had already been two battles in northern England. King Harold won the second, the Battle of Stamford Bridge, killing both Harald Hardrada and Tostig. Victory, however, was dearly bought. Many of Harold's men, not least his ►

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## **3 BATTLE OF HASTINGS**

After victory at Stamford Bridge, King Harold's exhausted men rushed south to fight another battle, against the impatient William at the town of Hastings. It started in the morning of **14th October** and lasted all day. The battlefield

was a hill later named Senlac Hill by Anglo-Norman chronicler Orderic Vitalis. The English army fortified their position at the top of the ridge. The area was surrounded by scrub and streams, so William had no choice but to attack uphill.

**Harold's army held an advantageous position**

#### **Harold's English army**

The king was flanked by his earls and an elite corps created under King Canute. The majority of his troops were conscripts who had trained together and were therefore very effective warriors.

**William's army had to attack uphill**

#### **William's Norman army**

The Norman army consisted of both professionals and conscripts. William's main asset was the cavalry: well-trained knights with good stallions. Mercenaries from France and Flanders were part of the army too.





crucial archers, lost their lives. In the middle of the victory party, a messenger reached the exhausted army. He explained that the Normans had landed at Pevensey, more than 350 km (240 miles) south of their current position. He also said that William's troops had swept through Sussex, the area in the south of England that was the seat of Harold's earldom. It was important for him to react quickly.

Hastily, Harold marched his troops south. In just five days they reached London, the heart of the kingdom, where Harold paused to prime the army and wait for fresh troops. William sent a message requesting that they settle the dispute in a single battle. Initially Harold refused to answer, but then accepted the terms in the belief that God was on his side. He marched towards Hastings.

#### **The armies met on a hill**

Some historians believe that the king's intention was to sneak up on the Normans in a surprise attack or to

contain the Normans until more troops arrived. However, none of these plans would have been any value to him – William was too combative. As part of a deliberate strategy, the Norman troops pillaged not simply to procure themselves food, but also to lure Harold to an area of the country where William wanted to fight.

William had already reached England by 27th September and spent the time consolidating his position on the south coast ahead of a march to London. Some sources place his army at the battlefield the night before, but others claim that William marched his troops there from Hastings at 6 AM on the day of the battle, 14th October. After about an hour the Duke stopped, so he and his warriors could put on their chainmail armour. In a rush, William put his on back-to-front. The troops saw this as a bad omen, but William laughed, and turned it around. Shortly after they glimpsed Harold's army for the first time: rows of men with

regal standards, red and gold flags, and gleaming breastplates, swords and axes.

William's army continued on, and the two sides met on a ridge later named Senlac Hill. Harold's troops fortified their position at the top of the hill, cutting off William's route to London. Battle was bound on both sides by swampy areas and scrub, so the armies were unable to penetrate around and attack each other's vulnerable flanks.

#### **"Out! Out!" English warriors cried**

William's army ended up fighting from the foot of the hill, which obviously meant that the Normans would have to attack up a steep slope.

His army took up their positions in a long line. At the front were the archers, crossbows shooters and fighters with catapults; behind them the infantry, in full armour. At the rear, the cavalry waited on their snorting, head-strong stallions. William placed himself in the middle of his men. Beside him a soldier waved the papal banner, evidence that

## Medieval fighting in the Viking age

**The two armies used many of the same weapons, but William based his troops on a modern knight corps, while Harold relied on proud Viking tradition.**

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### Shields

The Viking warriors' shields were made of wood, usually covered by leather and the edge filled with metal. The centre of the shield had a metal knob, which was also used as a weapon.

### Axes and swords

Battle axes were a more common weapon than the sword. Harold's troops used axes that were lighter with a thinner blade than regular axes. They were aimed at the enemy's right hand side, which was not protected by their shield. The sword was double-edged, but expensive, so many used long combat knives instead.





the Duke had the Vatican's support. Beside the army were priests ready to offer prayers for prosperity and victory.

Some suggested the Normans were badly in need of help. The two armies had a similar number of soldiers, but Harold's position had the tactical advantage. Also, despite the battle against Harald Hardrada and the long march, his men were prepared for battle. High on the hill, the king's standard blew in the wind: a banner embroidered with gold and precious stones, and adorned with the image of a fierce warrior.

Harold's army stood ten rows deep. At the front, the men were covered with large shields that warriors held close to form an impenetrable wall of leather, wood and metal. If William wanted the crown and the power, he had to attack uphill, past the wall of shields to defeat Harold's ferocious troops. The two sides weighed each other up – and listened. From the English rows, deep resolute voices could

*During Norman rule, women in England lost their right to own property. It wasn't until 1882 when the law was reinstated.*



be heard shouting "Oli-crosse (Holy Cross)", "Good Mite (Almighty God)", and "Ut! Ut! (Out! Out!)" From the Normans' side, scattered verses of the Song of Roland, a French hero, rang out.

#### Axes and clubs came into use

Trumpets blared, ready for battle, and on the Norman front lines the archers advanced. In a moment, the air was filled with arrows, drawn against the English. A surprising silence followed – the Normans had misjudged the hill's incline, and most of the arrows went over the heads of Harold and his men.

Meanwhile, the Normans were in a state of confusion. During battle, archers would gather up the opponent's errant arrows and use them again, but surprisingly few arrows were fired from the English side. Harold had lost so

many archers in his battles against Harald Hardrada that a key weakness was now showing.

William decided to send in the next line of warriors. Clad in chainmail and heavy helmets, and armed with shields, swords and spears the men headed up the hill towards the English. Javelins and stones whirled toward them from the English ranks, where the men also brandished long-handled axes and metal-clad maces. A moment of hesitation, and William's infantry retreated, only to return and attack again at full force.

The two armies clashed. Iron met iron, wooden shields splintered, and men screamed in pain as they were pierced by the long swords. Helmets flew through the air, and blood flowed over the men's faces, rivulets covering ▶

#### Stirrup

William's army used the most modern weapon of the day: war horses. The prerequisite for the cavalry and knights' success was the stirrup, an Asian invention that spread to Europe from around the 7th Century. The stirrup helped secure the knight to his horse, making fighting easier.



All the soldiers wore conically shaped iron helmets. They were either cast in one piece or made from four plates lined with leather.

#### Crossbow, bow and arrow

Both bow and crossbow were fired by the Normans at Hastings, and both armies used up to two-metre-long bows. The arrow heads were either feathers or parchment.

#### Armour and helmets

High-ranking warriors wore real chainmail, but many were simply protected by metal rings sewn on a long robe made from either fabric or leather. The iron helmets provided a nose guard.

#### Spears and lances

The Normans also used the lance during the Battle of Hastings. This was basically a long, wooden spear with a spiked end that could be transferred to the hand for close combat.





their soft leather shoes and soaking into the battlefield. It soon became clear to William that most of it was Norman.

The time had come to play his trump card: his cavalry. The English army had horses, but they had no experience of using them in battle. In contrast, William's horses were exquisite stallions, ridden by well-trained knights, dressed in ankle-length coats of mail and equipped with swords and heavy lances.

Their hooves pounded the ground as the large animals stormed up the hill amid loud calls from the Norman lines. Again stones, spears and axes went into combat. The knights pulled hard on the reins, turned back, and then attacked again with dogged persistence.

Over the sound of crossed swords and cries of pain could be heard the wounded horses' desperate cries. Again the Normans attacked, while still more of their horses fell to the ground, wounded or dead.

Everything was in vain. The English stood firm, reinforced by the shield wall at the top of the hill and their effective weapons, especially the long axes,

whose grisly effect was evident as they split through both horses and riders.

### The Normans took flight

On the Norman's left flank there were many casualties as both infantry and cavalry began to falter, and soon they were retreating down the hill. At the sight of their fleeing colleagues the men in the middle of the line pulled back and even on the right flank turmoil ensued. A rumour spread that William was dead. Chaos threatened, as the fleeing Normans were now on the back foot.

Purposefully, William raised his helmet so his men would know that he was still alive, and rode rapidly down into the middle of his ranks. Others tried to stop the fleeing warriors, shouting that there was no escape route: behind them was only the sea and hostile English ships, ready to pounce on them.

Unhesitatingly, William rounded up a large group of fighters – some sources claim as many as 1,000, but most historians believe that figure is

exaggerated – and rode after the Englishmen, who were chasing the fleeing Normans into the swampy area near the battle site. Out here, William's knights were superior as they had moved away from the hilltop, and they ruthlessly hunted down and killed all of the English troops.

### William bluffed his way to victory

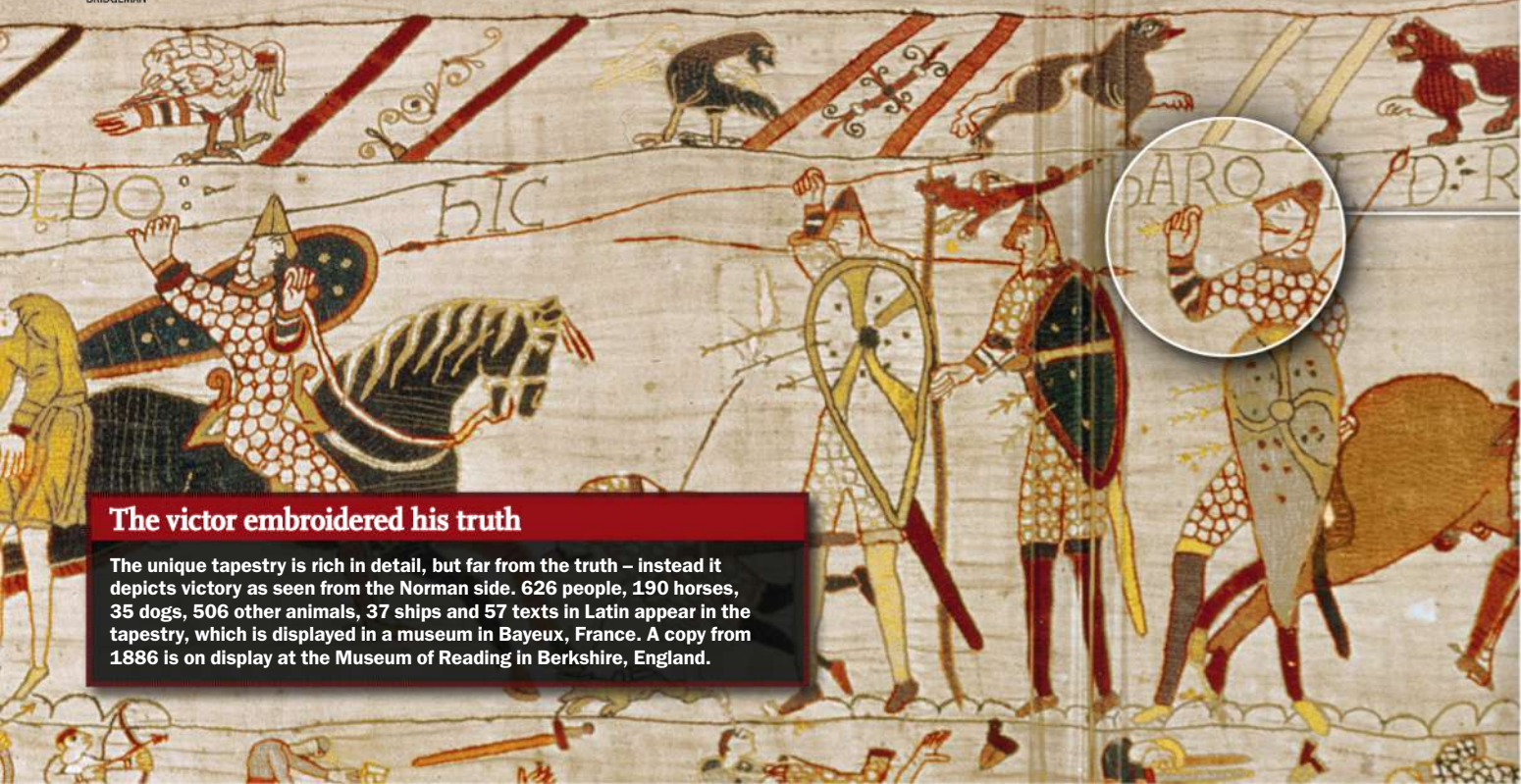
Relieved, the Normans regrouped. The men helped themselves to a little food and the horses waded into the stream that crossed the battlefield to drink. For the Normans, a crisis had been averted and the field was now empty. Both sides had suffered deep emotional scars.

Meanwhile the afternoon shadows grew, and William was painfully aware that he hadn't won yet. The English advance had been prevented, but their troops still blocked the way to London. The men could not face the fight and retreat would mean a total surrender. The Duke sent his troops back up the

## William's victory recorded on tapestry

**After the victory at Hastings, William the Conqueror's half brother, Bishop Odo of Bayeux ordered an enormous tapestry to commemorate the events of 1066. The Bayeux Tapestry was a 70-metre-long and 50-centimetre-high embroidered retelling of the Norman conquest.**

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### The victor embroidered his truth

The unique tapestry is rich in detail, but far from the truth – instead it depicts victory as seen from the Norman side. 626 people, 190 horses, 35 dogs, 506 other animals, 37 ships and 57 texts in Latin appear in the tapestry, which is displayed in a museum in Bayeux, France. A copy from 1886 is on display at the Museum of Reading in Berkshire, England.



hill, but neither infantry nor cavalry could break through the English fighters' wall of shields. And because of the swampy ground, they could not attack the flanks either.

It was a desperate situation and William needed to devise a strategy. He had noted how the English stormed forward as the Normans fled. So now it was time for his knights to flee again. The Duke's order quickly passed through the cavalry ranks, and soon, one after the other his horses turned and rode away from the battlefield.

Immediately, the English went after them. The Normans turned again, galloping directly into the dissolved English line. The Normans carried out this false retreat twice and using this tactic they soon had the better of Harold's trusted men.

### The death of King Harold

The English lines had been thinned out. Dozens of professional warriors and noblemen had been killed, forcing lightly

*William cemented his power in England by building one Norman castle after another. He built many fortresses including the White Tower in London.*



armed conscripts to the front of the ranks. Before them lay the bodies of warriors and horses who had given up their lives during the hours-long battle.

William's army was also exhausted. Many of them had lost their horse. William himself had three horses shot from under him. But the Normans could now see an end to the battle and made ready for one final thrust. Once again the archers sent their deadly rain of arrows. This time the arrows hit their targets. In their triumph, the Normans watched the English king fall to the ground, mortally wounded by an arrow to the head.

The news – and horror – spread quickly through the English army and the rank-and-file troops pulled back in panic. The Normans needed to move quickly and rushed forward to seize

Harold jewelled warrior's flag. At the same time, Harold's most faithful men paid respect to their dead king by standing in a circle around the corpse and they fought to the last drop of blood against the victorious Normans.

After ten hours of battle, the Battle of Hastings was over. William pitched his tent on the hilltop where Harold's banner had proudly stood, and soon after they advanced towards London.

Many tried to follow the Norman Conquest, but no foreign power would successfully invade English soil again. ■

#### FURTHER READING

• Harriet Harvey Wood: *The Battle of Hastings. The Fall of Anglo-Saxon England*, Atlantic Books, 2008 • Christopher Gravett: *The Fall of Saxon England*, Osprey, 1994

## Knights were mounted bandits

The medieval ideal of chivalry had not yet been established in 1066.

Duke William's main force of mounted warriors aspired towards the new Middle Ages. But they lived their lives far from a future knight's ideals of nobility, heroism and social acceptance. Instead, William's knights have been called bandits on horseback, who eagerly threw themselves into looting throughout England following the victory at Hastings.

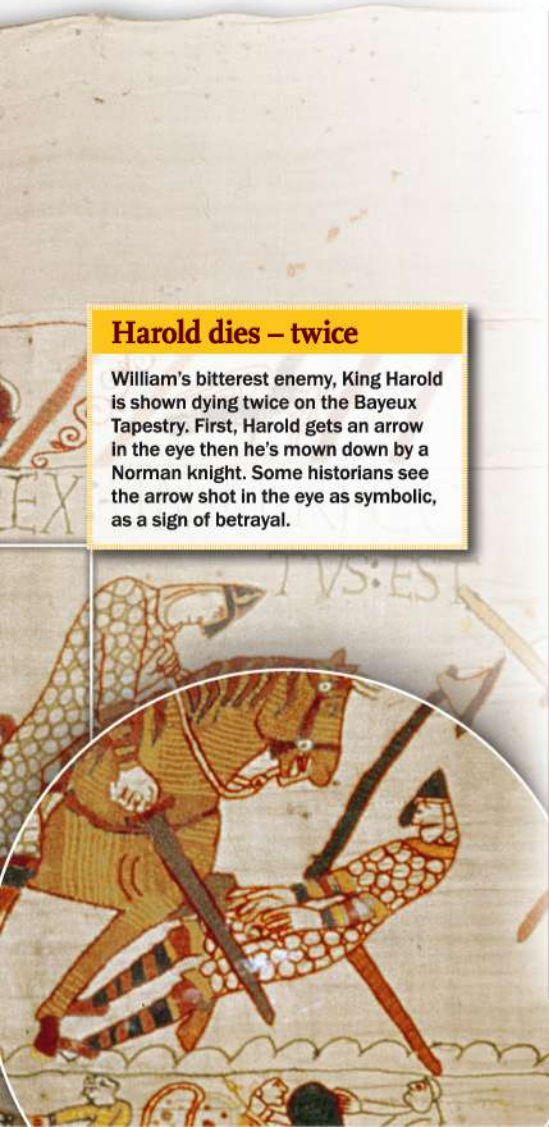
Many were the younger sons of wealthy families as the elder boys were sent to the local prince or squire to learn to fight. Their family paid for all equipment: sword, lance, armour and horses. When the knights finally went to war, they effectively invested in William's cause with no return – as younger sons could not expect to inherit land or property, his promise of land and riches was an attractive one. After William's coronation at Westminster Abbey on Christmas Day 1066, the knights would play a key role in securing the kingdom, settling all over England.



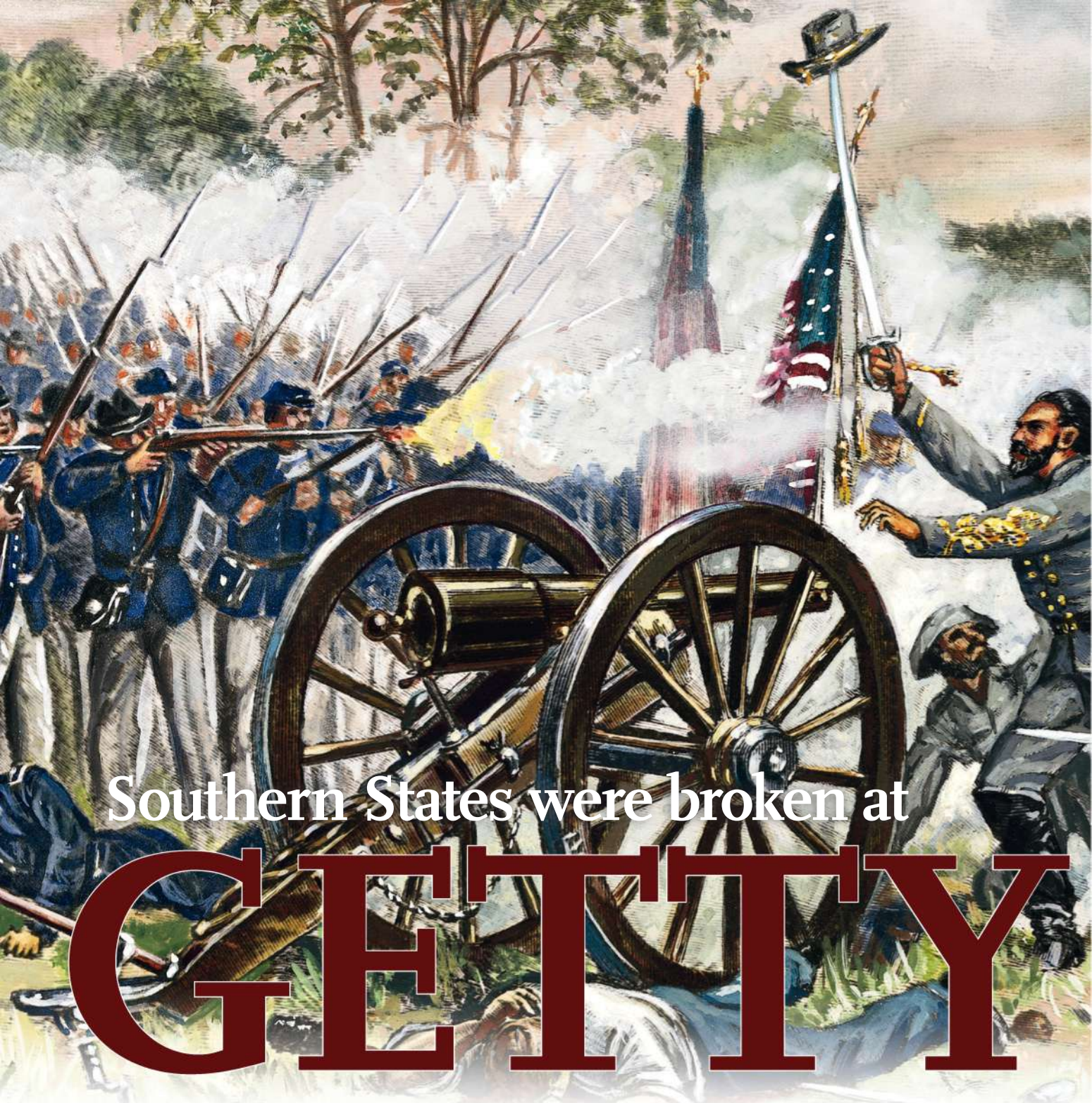
*Norman knights in the Middle Ages were known and feared from Spain to the Holy Land.*

### Harold dies – twice

William's bitterest enemy, King Harold is shown dying twice on the Bayeux Tapestry. First, Harold gets an arrow in the eye then he's mown down by a Norman knight. Some historians see the arrow shot in the eye as symbolic, as a sign of betrayal.







# Southern States were broken at **GETTYSBURG**

*The American Civil War's biggest and most important battle is fought over three bloody days in July 1863. The rebellious Southerners want to crush the North's Union Army quickly and invade the North to force a decisive battle, but at the most critical moment in the conflict they run out of ammunition.*

BY ELSE CHRISTENSEN



**June 1863**

*The Confederates invade the Unions' territory to try and force a decisive battle. A victory could threaten the North's capital Washington and dictate peace terms.*

Lines of soldiers march along the dusty road. The men have marched for four weeks and at first glance, are a sad assembly: their eyes are red-rimmed, and there's not much left of their light-coloured uniforms. The war has lasted for a few years, and their grey jackets and trousers are tattered and torn. Many soldiers have given



*In a desperate last attempt for victory, 12,000 men faced a full-on frontal attack in an open space. Total losses were over 50 per cent.*

POL/FOTO/CORBIS & ISTOCKPHOTO

## A QUICK OVERVIEW

**Background:** the slave question has split the US in two. There is a political and economic abyss between the industrialised northern states and the farming-dependent south. The South wants to walk away from the union and war breaks out. **Course:** highly motivated southern soldiers try to win victory over the North to exploit their greater resources. The main battle is at Gettysburg, where southern dreams are shattered. **Consequence:** the Confederates were finally defeated. Their enemy was superior – both in number and in ammunition.

# GETTYSBURG

into temptation to scavenge their dead enemies on the battlefield, so blue Union uniforms mingle with the Confederate grey, giving the army a patchwork-like look.

Some of the men march barefoot because their boots are completely worn through, but there are no complaints from the soldiers. When the band starts to play "Dixie", voices unite in a "Hurrah! Hurrah!" and the promise to "live and die as a Reb".

It would be foolish to judge these men on their physical appearance. They may well look like tramps, but they are excellent soldiers. And

if things go as planned, they are on their way to another victory.



**30th June 1863, in the evening**

**General George G Meade's headquarters, 14 kilometres from Gettysburg.**

General Meade has no idea how close the enemy army is. Yet worried thoughts are running through his head. Only two days have passed since he was awoken early by an emissary from President Lincoln, with the message that he had been appointed ▶



# Opposites met at Gettysburg

**The South and North's commanders were very different. Lee was a warrior of the heart, Meade's passion was engineering.**



**Lee was the family brand.** Robert Lee was the son of Virginia Governor Henry Lee, a highly decorated soldier from the War of Independence against the British. Therefore, it was obvious that Robert Lee would train as an officer from the prestigious military academy West Point.

As the conflict between North and South came to a head, Lee felt torn between loyalty to the United States and his home state of Virginia. However the latter weighed heaviest – Robert Lee was both a local patriot and slave owner.

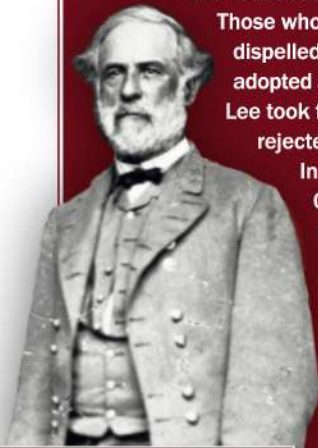
In 1862, Lee commanded the Army of Northern Virginia in a number of key battles. At the beginning of the war, Lee was accused of being over-cautious by a number of Confederate newspapers.

Those who dubbed him "Grandma Lee" were quickly dispelled of their misconception when he quickly adopted aggressive tactics. After the defeat at Gettysburg, Lee took full responsibility and offered to resign. It was rejected by the Confederate President Jefferson Davis.

Instead, in January 1865 he made Lee Commander for all Confederates. Shortly after the inevitable happened – the Northern States' superior resources forced the South to its knees and General Lee had to surrender.

He felt that the South was unnecessarily humiliated, and he personally lost his US citizenship and thus the right to vote.

At the beginning of the war, Robert Lee, already suffered from a heart condition, and died of a stroke in 1870, aged 63.



ROBERT EDWARD LEE (1807-1870)

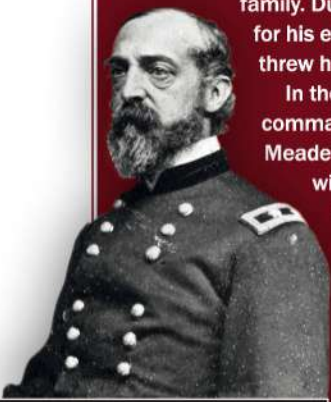


**Meade loved lighthouses.** George Meade graduated from West Point, but did not seriously dream about a military career. He pursued a career as a civil engineer dividing his time between railway construction and the War Department. He married aged 25 and rejoined the army in the engineering corps to support his family. During the Mexican-American War, he was praised for his efforts and promoted. When peace came, Meade threw himself with enthusiasm into building lighthouses.

In the civil war he was a capable officer and ended as commander of the Northern States' army. Although Meade's soldiers described him as "a snappy old turtle with bulging eyes", his heroism gained him high respect from his troops.

The victory at Gettysburg showed that confidence was justified, although Meade was criticised for his half-hearted attempts to pursue the retreating Confederates.

George Meade was only 57 years old when he died of pneumonia and complications from his war injuries in 1872.



GEORGE G MEADE (1815-1872)

commander of the Northern States' main army. The responsibility rests heavily on his shoulders. In the glow of the oil lamp, he sits down to write to his wife:

"I continue in good spirits, but feel the pressure of responsibility and great expectations. Pray for me that our Heavenly Father will allow me to be an instrument to save my country and promote a just cause".



**1st July 1863, 07.00**

**Chambersburg Road, west of Gettysburg, in the northern state of Pennsylvania.**

The sun cuts through the morning mist. From the fields along the road, ripening grain stands proud. The Confederate advance guard – two divisions totalling 13,500 men – move forward. The atmosphere is relaxed as the men are smoking and chatting. The barefoot are particularly optimistic in the hope that there is a shoe shop in Gettysburg.

Suddenly loud cries break out. Talk within the ranks stops. The front lines have seen something: in the distance, glistening in the sun. Guns? The line breaks up, following orders to create a chain. The flag bearers take their coiled rebel flags down from their shoulders and unfold them. A shot rings out from the distance. It's the Yankees.



**1st July, 07.00**

**The North's field guard post by the roadside discovers the advancing force.**

Vigilant Union soldiers follow the massive dust cloud that comes into sight on the road. They hear a dull rumbling sound and the stomping of thousands of feet. They can make out people, vehicles and guns.

"The rebels are coming!" is the cry, as a soldier takes up his gun and fires against the advancing force. Of course it does nothing – the troops are too far away – but the first shot has been fired in the Battle of Gettysburg.



**1st July, 10.00**

**Field camp, west of Gettysburg. General Reynolds, commander of the local corps, arrives after his night's rest.**

General Reynolds' heart is pounding, he's about to ride to the top of the hill where a few senior officers are waiting impatiently. The sight of frightened civilians fleeing from Gettysburg is a haunting one.

"Hurry up, General, hurry up! They are about to break through our line!"

Reynolds turns to his adjutant to tell him that he must go and warn General Meade immediately. He should go fast as hell. The aide



must ride like the wind, stresses Reynolds as he surveys the scene.

Reynolds rides on to join his soldiers. A few hours later he's dead from a bullet to the head.

#### **1st July, 11.30**

**General Meade's headquarters. Reynolds' adjutant arrives.**

Adjutant Weld jumps off his horse, which snorts and streams with sweat. With haste, he delivers the message from Gettysburg:

"The enemy is coming in force, and General Reynolds is afraid that they will take the hills on the other side of town before he has a chance to. He will fight them within the city and hold out as long as he can".

"Good Lord", said General Meade, "that's less than 80 kilometres to Washington!"

#### **1st July, 15.30**

**Hastily, Meade has sent reinforcements to Gettysburg. A division takes position on a hill 1.5 kilometres outside the city.**

The afternoon sun is baking hot. The commander at the ridge is Major General Francis C Barlow, and he's squinting. Grey-clad troops push forward – too many. Rifle fire is intense and several of his men fall. The line begins to recede, and unrest is spreading. The first blue soldiers flee.

Annoyed, the Major General gets on his horse. The men must hold the position at all costs, otherwise the route to Gettysburg will lie open to the enemy. Barlow does not get very far. A shot hits him in his left-hand side causing him to falter in the saddle. Around him, men and horses fly around, and only his strength keeps in him on his horse. A soldier grabs his shoulder to support him, but is shot and Barlow falls to the ground. The Major General feels a sharp pain in his back and faints. When he awakens, he's in a Confederate field hospital.

#### **1st July, 16.30**

**Barlow's beaten corps flee towards Gettysburg with the enemy in hot pursuit.**

Nothing is as it used to be in Gettysburg: no

shopkeepers selling rows of bags of flour and grain across the counter to local housewives, no hammering sounds from blacksmiths. Banks and offices are shuttered, the usually bustling town is silent and none of Gettysburg's 2,500 inhabitants can be found on the street.

Earlier in the day, children perched on the roofs to get a glimpse of the fighting. Now they've been called in and shut away safely in closets and under beds in locked houses.

Suddenly it happens: shots start flying across the streets, along with the sound of hoarse cries, hooves rumble and thousands of boots stomping away. Just like a large blue river, an entire Union corps flows in panic through the streets. Just behind them, a Confederate force follows. The rebels have captured Gettysburg.

#### **2nd July, early morning**

**At the exact moment as General Meade approaches his troops, his order of the day is being read to the disillusioned Northern States' men.**

Hard-hitting words are shared with the ranks. "It is this army", writes General Meade "that delivers us from the enemy's presence. This is home, hearth and our sacred altar. In this hour, senior officers have the authority to execute any soldier who does not live up to his duty".

#### **2nd July, about 11.00**

**Confederate headquarters. No one has followed up on yesterday's victory.**

Irritated, General Lee paces back and forth outside his headquarters. His deputy, Lieutenant General James Longstreet has gained many victories with his cautious tactics, but this is too much! He'd used the whole morning to plan the attack, the one that Lee had ordered several days ago. While they hesitated, the enemy could fortify its position and then the Union Army could slip in and beat them back.

"Attack on the right flank," says Lee. Longstreet hesitates, and looks out over the

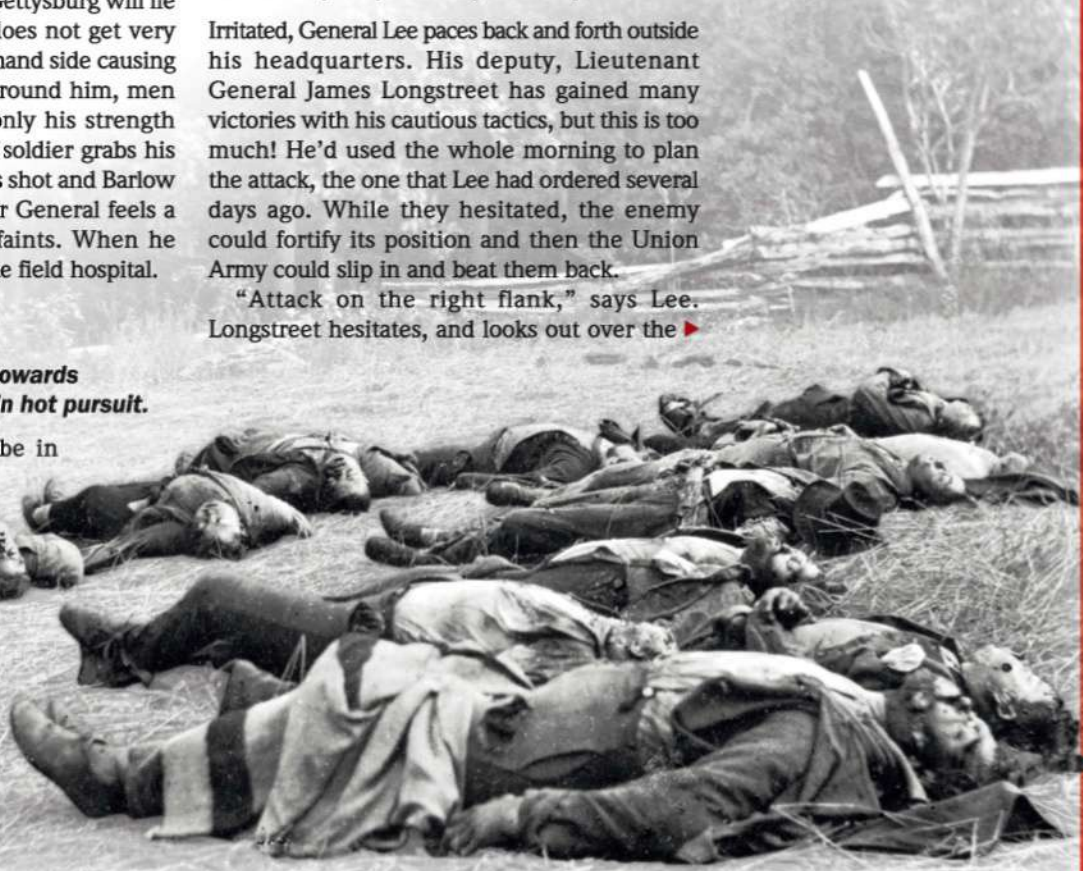


Typical infantry weapons were single shot rifles (pictured), but by the end of the war the North were using Gatling guns – the forerunner of the machine gun.

GUINS INTERNATIONAL


Photographs were a fairly new invention during the Civil War. The photographers on the front shocked the public with their depictions of the horrors of war.

POLIFOTO/CORBIS





horizon. Can Lee wait any longer, as an entire division will soon be here? Lee throws up his arms and launches into Longstreet's plans. His chest hurts and he's tired, but it's not time to think of that kind of thing now.

 **2nd July, about 16.00**  
**While the rebels' procrastinate, Meade creates a strong line of defence at 2.5-kilometre-long Cemetery Ridge. It runs west before curving south to the hill, Little Round Top, at its most southerly point.**

Colonel Joshua Lawrence Chamberlain is trying to maintain his composure as the first grenades strike around him. Before him stands his superior officer.

"I have placed you here: you and your 20th Maine regiment at the Union army's extreme left flank. Do you understand? They must hold that position at all cost".

"Understood", answers Chamberlain in a high, clear voice. If the enemy makes it to the end, they can circumvent the Union army and drop in at the back. Yes, that's understood. Once his commanding officer has gone, Chamberlain gets his soldiers into position behind a low stone wall and some large rocks.

This and only this, stands between them and the Confederate forces. Now they wait.

**Confederate soldiers showed great courage and discipline in scores of bloody frontal attacks on Northern States positions.**

POLIFOTO

 **2nd July, afternoon, Little Round Top**  
**The 20th Maine regiment has overcome two onslaughts. Now comes a third.**

Chamberlain watches as the rebels proceed at a steady pace. He will only attack when they're up close to the jagged

mound, opening the charge with a loud battle cry. Chamberlain waits. He is concerned that they are low on ammunition and cannot afford too many misses. Wait, wait. Now!

"Fire!" roars Chamberlain.

A row of rebels is picked from the ranks and fall to the ground, which is already littered with the dead and wounded. Yet the determined attack continues. The rebels are close to the peak of the mound when the terrible losses take their toll. The attack subsides and the surviving Confederate soldiers flee.

Chamberlain kneels by one of his men, a young private called George Washington Buck. He is badly wounded. Blood pulses out of an open wound in his chest and forms a stream between the rocks on the ground. The wounded man stares rigidly into the sky.


"It's been hard on you", says the Colonel.

Chamberlain knows who the man is. A short time ago a finicky weapon master had demoted him because of a minor incident.

"Just tell my mother that I died like a coward", whispers the young man.

"You die as a sergeant", counters Chamberlain. "I hereby promote you for faithful service and noble deeds on the battlefield at Gettysburg".

The young man smiles and breathes his last.

 **2nd July, 19 – 20.00. Little Round Top**  
**The 20th Maine Regiment has performed heroically, but it has lost a third of its men and its ammunition has almost run out.**

The soldiers are desperately looking for cartridges on the ground and from the dead men's pockets.

A worried-looking Chamberlain watches the rebels advance for another attack. This time they will not be met by deadly gunfire. This time it will succeed, he thinks. Chamberlain does not know what he should do. He is not a trained soldier. He's a rhetoric professor at Bowdoin College in Maine. Or was – until the war came, when he encouraged his students to enlist and signed up himself as an officer.

Chamberlain is thinking furiously as Confederate soldiers begin to climb the slope. The men are waiting for his order. He has none. Out of the corner of his eye, he sees a pair of inexperienced young soldiers raise their rifles over their head to use as clubs. Chamberlain has a better idea:

"20th Maine!" he roars, "ready to counterattack! Bayonets on!"

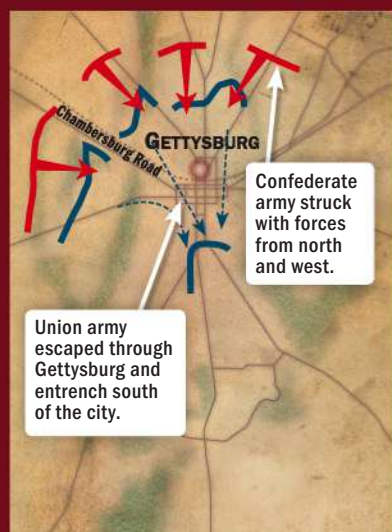
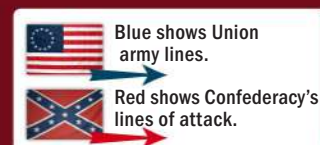
The soldiers flock around him. They hear the solid click of steel against steel, and a fresh glint appears in the men's eyes. There has always been something magical about the order "bayonets on!" It does





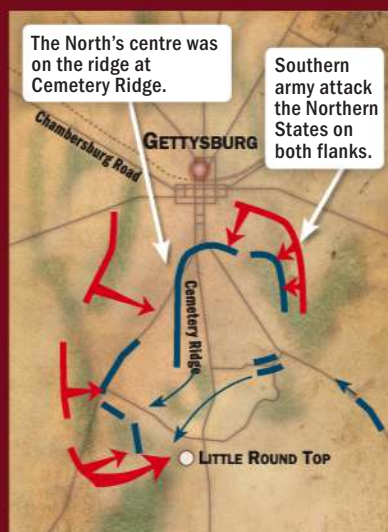
# South attacks over three days

**Gettysburg was captured by Confederates in the first day's fighting, but the Union Army had time to put a strong defence line south of town.**



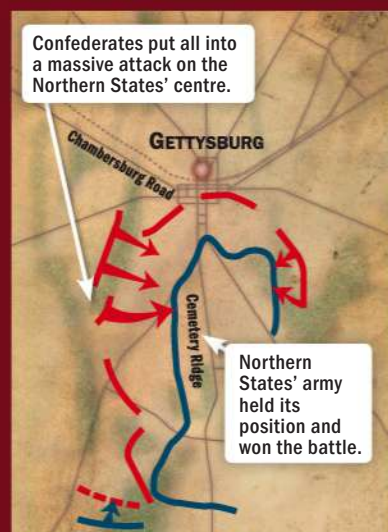
## South had a head start

**Day 1:** Confederate forces advanced and captured Gettysburg before the Union Army brought in reinforcements to block their advance. The first day was a triumph for the Confederates.



## North held out

**Day 2:** the Confederates follow-up attacks on the Northern States' army's flanks came too late. Defenders made a heroic stand against several very determined Confederate assaults.



## South gambled and lost

**Day 3:** Confederates put everything on the line and tried a desperate attack on the centre of the Union line. It went completely wrong. Attacking forces lost over 50 per cent of their soldiers.

something to soldiers. Chamberlain remembers reading about it.

"20th Maine! Forward! "He shouts and a dense mass of blue soldiers throw themselves, wildly roaring, down the slope.

The greys stop and raise their guns. A murderous onslaught propels the 20th Maine, but the survivors do not notice. In a rage stronger than death they storm at the enemy with bayonets in hand. The greys stiffen in shock over the blue soldiers' lack of fear and then turn and retreat down the hill.

Chamberlain and his 20th Maine have done it. The Confederates don't make any more attacks on Little Round Top.

### 2nd July, late at night

**In General Meade's headquarters, a council of war has just finished.**

The moon shines clear and ghost-like over the countryside, as the senior officers exit from the small white-painted house that has been commandeered for General Meade's headquarters. When the last of them is about to leave, Meade grabs hold of General John Gibbon's arm, whose troops are

defending the centre of the Federal line on Cemetery Ridge.

"If Lee attacks tomorrow, it will be on your front", says Meade softly.

Astonished Gibbon's asks how he knows.

"Because he has attacked both our flanks without success. If he tries again, it will be it in the centre".

"If he attacks, then we will kill him", says Gibbon with firmness in his voice.

Before long the sun rises, with a third – and decisive – battle to come.

### 3rd July, early morning

**Yesterday's failed attack came at a heavy cost, but General Lee has not given up.**

A thick, grey mist hangs over the battlefield. Lee rides pensively beside Lieutenant General Longstreet, who makes his pitch:

"General, I've had my scouts out all night, and I think they still have an excellent chance to go right up to Meade's army and get him to attack us".

Lee sweeps him aside. He clenches his fist and points at the centre of the Northern States' army line on Cemetery Ridge. ▶





**In 1863, the North's President Abraham Lincoln spoke at the inauguration of the newly completed cemetery near Gettysburg.**

THE GRANGER COLLECTION

"The enemy is there. And I will attack him there", he says firmly.

Longstreet takes a deep breath.

"General, I have been a soldier all my life", he says. "I should know as well as anyone what troops can and cannot do. I do not think that anybody with a force of 15,000 men could take that position".

Lee's face is expressionless. He does not agree with Longstreet. The decision is made.

  **3rd July, 13.00**

**Lee wanted the Northern States' gun batteries destroyed before the big attack.**

"Stay calm!" reads the order to the blue-clad gun crews as the Confederate artillery's first massive tranche screeches into view. Grenades fly, ammunition explodes in orange-red flashes, canon fire shatters, and men and horses flinch from the shrapnel.

Death prowls among the Union soldiers, yet they fight back hard, again and again to demonstrate their superiority. As guns are destroyed, they renew their offensive. The Northern States' artillery's combat power remains intact. Ammunition is not a problem: they have plenty, but the Confederates don't.

The Confederate artillery officers are hesitant. The bombardment is not scheduled to last this long, but they have orders to defeat the

enemy's artillery and see no alternative but to continue firing. As minutes turn into hours, the deafening cannon fire goes on and on, in the war's longest artillery duel.

 **3rd July, about 15.00**

**Nine Confederate troops with a total of 12,000 men line up for an attack. The temperature is 33° Celsius in the shade.**

Confederate Infantry troops look across the valley. The Northern States' army has lined up behind a stone wall on Cemetery Ridge. Separating the two armies is 500 metres of open field.

Small, black streams of sweat mixed with dust runs down the men's faces. Weapons, belt buckles and buttons shine in the baking sun. Unrest is spreading throughout the ranks, as more fall fainting, overcome by heat and exertion.

"A position that we cannot stomach", a voice whispers loudly.

 **3rd July, about 15.00**

**Along with Brigadier General Lewis Armistead, Major General George E Pickett leads the Confederate attack.**

Armistead raises his binoculars and looks across the valley. His face is pained.

Before the Civil War he served in the supply troops in California as did his close friend Win Hancock. The Civil War came between them, as each signed up for his respective army, but just before they parted with a warm handshake, Armistead said:

"May God beat me to the ground if I ever lift a hand against you in battle".

Now, General Hancock in his blue uniform lies waiting just across the other side of the sun-drenched valley, ready to repel his old friend's attack.

"Attack the enemy, and think of Virginia!" Pickett's voice cuts through Armistead's memories. The grey ranks move to action.

 **3rd July, a little after 15.00**

**Brigadier General Ambrose Wright from the Confederates is waiting in the wings with his infantry and watches the attack.**

Proudly, the Brigadier General watches his countrymen march stubbornly forward despite the hostile gunfire. Confederate guns fire again – until they're suddenly silent. Ambrose Wright grabs hold of a man and asks what's happening. The ammunition has run out. Run out! With a cold hand, Ambrose Wright grabs at his own heart. The attacking force, which has only reached halfway into the

## Only victors were given a decent burial

After the battle almost 8,000 men were buried in a hurry before they completely decomposed in the summer heat. Hundreds of dead were piled into mass graves, which were filled to the brim, so the body on top was covered with 30 centimetres of soil. In the days after the battle, a heavy rain swept the soil away, exposing the bodies again.

"In many places there were protruding limbs and sometimes

heads, and pigs dug the corpses up and ate them", a deeply shocked Gettysburg citizen wrote to the Pennsylvania Governor.

Immediately, the Governor decided to build a cemetery. The State bought seven hectares of land and the job of burying the dead went to tender. The winning bid was for \$1.59 per corpse.

The cemetery was only for Union soldiers; Confederates had to stay put.

**3,512 Union soldiers lie side by side at the Gettysburg National Cemetery.**



POURTO/CO-REB



valley, should have had artillery support all the way, but 120 Confederate cannons are pointing silently into the air, while the infantry goes unprotected against the enemy.

### **3rd July, 15.00 – 15.20**

**Major General Pickett's selected troops march forward despite terrible losses.**

All of the Northern States' guns fire directly on the dense mass of advancing grey-dressed soldiers. Exploding grenades tear big holes in the ranks. Men drop everywhere. Some are cut to ribbons and die on the spot; others surrender their lives slowly and painfully.

New soldiers enter the ranks to replace those who have fallen. They try with all their might not to look at the wounded, not to hear the heartbreaking wails that rise up around them. Sweat runs into the men's eyes. It's as if the earth itself is on fire.

Northern soldiers at the stone wall show up like a faint blue mass. From their glinting guns they fire volley after volley. Still the attack continues. Forward! Forward!

### **3rd July, 15.20**

**The two armies clash in a bloody melee of combat, man against man.**

The final step requires all the men's courage and willpower. In an inferno of gunfire, shouts and screams, Confederate men roar into the Northern States' line. Weapons discharge at close range, bayonets bury in flesh. Through the din the Confederate battle cry roars, its rebel yell is both loud and penetrating:

"Huuuu-iiiiii! Huuuu – iiiii!"

Grey-clad soldiers stumble over the stone wall in symbolic triumph as they penetrate enemy lines. Among them is Armistead. Shortly afterwards he falls unconscious, mortally wounded by two shots. The Brigadier General is spared the bitter scene at the end where the last Confederate soldiers are either killed or in retreat. He never sees their wild flight back across the open field.

His friend Win Hancock stands between his soldiers and watches it all. "Strange", is the word that comes to mind. "Strange".

### **3rd July, night time**

**Pickett's force has lost over 50 per cent of its men and Lee has lost the battle.**

Moonlight falls silently over the empty battlefield. For several minutes, General Lee sits slumped in the saddle staring apathetically ahead. The Battle of Gettysburg has been lost. Lee's companion is General Imboden, who

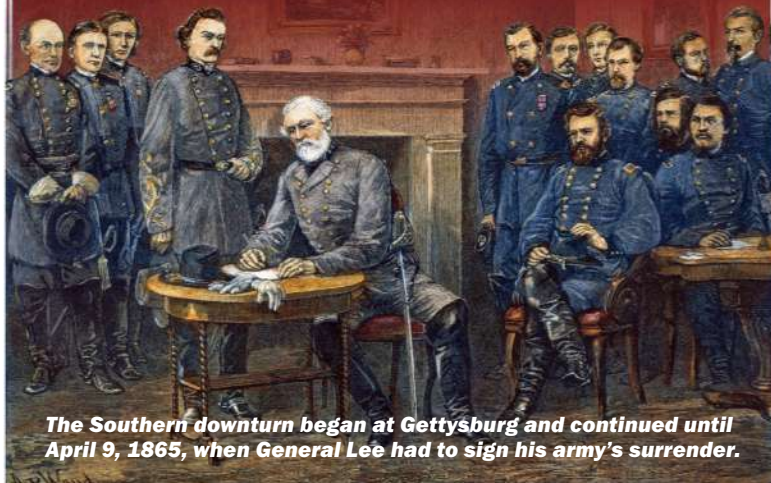
## Gettysburg was the beginning of the end

**The battle was the rebels' "last chance" as time was completely on the side of the resource-rich Northern States.**

**F**rom the beginning of the war, the Southern States had a major challenge: the North had a far bigger population. Therefore, in the long term it could gather and train more soldiers. Its industry could also produce large amounts of arms. And finally the North States' Navy could keep Southern ports blockaded resulting in Southern starvation. General Lee's completely logical

strategy was to win the war in a hurry – before it was too late. He provoked a decisive battle between the two armies.

General Robert Lee had good reason to believe in victory. His army had already won a series of battles with Northern State forces. The South also knew it had to win a decisive victory at Gettysburg. As it did not happen, the war was effectively lost.



THE GRANGER COLLECTION

clears his throat. "General, it's been a tough day for you", he says.

"Yes, it has been a sad, sad day for us all", replies Lee quietly

After about a minute, he stands in his saddle and in a voice quivering with emotion says.

"I've never seen troops behave any better than Pickett's Virginia division did today during their big attack on the enemy. If they had been backed as they should have been, this day could have belonged to us".

### **4th July, afternoon**

**Confederates retreat and head back home to Virginia.**

Rain falls incessantly from a leaden sky. The road is saturated and soaking wet soldiers shuffle along in the deep mud. They are drenched to the skin. Some of the men are still barefoot. They never did find a shoe shop in Gettysburg.

#### **FURTHER READING**

• Carol Reardon: **Pickett's Charge in History and Memory**, The University of North Carolina Press, 1997 • Glenn W. La Fantasia: **Twilight at Little Round Top, July 2, 1863 – The Tide Turns at Gettysburg**, Wiley, 2005 • Mark Adkin: **The Gettysburg Companion, The Complete Guide to America's Most Famous Battle**, Aurum, 2008



Blue  
sky  
became

# Hiroshima's

On 6th August 1945, a purpose-built B-29-bomber takes flight with the atomic bomb *Little Boy* on board. The pilot still doesn't know which Japanese city the newly developed weapon will be dropped on, only that the blast will destroy all life within a radius of 4.8 kilometres.



**WARNING:**  
Upsetting reading



# downfall

**AUGUST/1945**

WWII rages on. Japan's navy and air force are almost annihilated. So far, peace negotiations have been in vain. Bloody battles on Okinawa and several other islands cause Americans to fear potential casualties if they invade Japan. The atomic bomb would force Japan to immediate and unconditional surrender.



GETTY IMAGES



## 2.45 AM

**T**he mood is tense in the cockpit as pilot Paul Tibbets powers up the custom-built B-29. The plane weighs 12 tonnes more than a usual plane. The bomber and

its fearsome cargo in the Pacific wait at the end of the runway.

4.5 of its 12 tonnes are located at the front of the bomber. Today, 6th August 1945, the atomic bomb the *Little Boy* is ready to launch – it will deliver history's first attack using nuclear weapons. The bomber needs extra fuel for the long flight – over 2,500 km – to Japan's southern coast, which must include enough fuel for the return trip back to the island of Tinian in the Pacific.

The weight is not the only reason why the mood is so low. Robert Lewis is in the co-pilot's seat next to Tibbets. He used to command the plane, but his superior – Colonel Tibbets – decided to take the pilot's seat as part of the first mission with a new type of bomb.

Big, black letters on the side of the plane tell the world of Lewis' humiliation: just below the cockpit it says *Enola Gay*, which is the name of Tibbets' mother. Lewis is still furious.

Perhaps because of Lewis' bad mood, Tibbets has not told him how he intends to get the 65-tonne plane in the air: The experienced pilot plans to use the full runway and build maximum speed

Lieutenant Jacob Beser used a piece of rice paper to mark the frequency of the atom bomb radar-controlled altimeter. The rationale was that if he was captured Beser could eat the secret code.

**Rice paper for secrets**

before he tries to take off. Tibbets will concentrate on keeping the plane down while the four main engines get the plane up to speed slowly. When the *Enola Gay* is more than two-thirds down the runway, Lewis shouts:

"She is too heavy. Lift her now".

But Tibbets ignores him, keeping the wheels on the ground. A glance at the instrument panel shows him that the propellers are still not up to the 2,550 rpm necessary for the plane's takeoff.

Lewis reaches for his joystick as the end of the runway approaches.

"No – don't", shouts Tibbets.

Only at the last minute, when Lewis leans forward again to intervene, does Tibbets pull back on the stick, and slowly lifts the big plane, just as the runway comes to its end.

*Enola Gay* is in the air. In less than six hours, the plane will reach Japan and drop the world's first atomic bomb. The crew do not know much about the weapon or the mission – only that they have to launch a secret and very powerful bomb.

Three years and eight months have passed since Japan bombed the US

Pacific Fleet at Pearl Harbor on 7th December 1941, drawing the Americans into WWII.

At first, it seemed as though the Japanese were invincible, but slowly they were ousted from island after island in the Pacific after intense bloody fighting. The next step was to invade Japan or to force the Japanese's unconditional surrender.

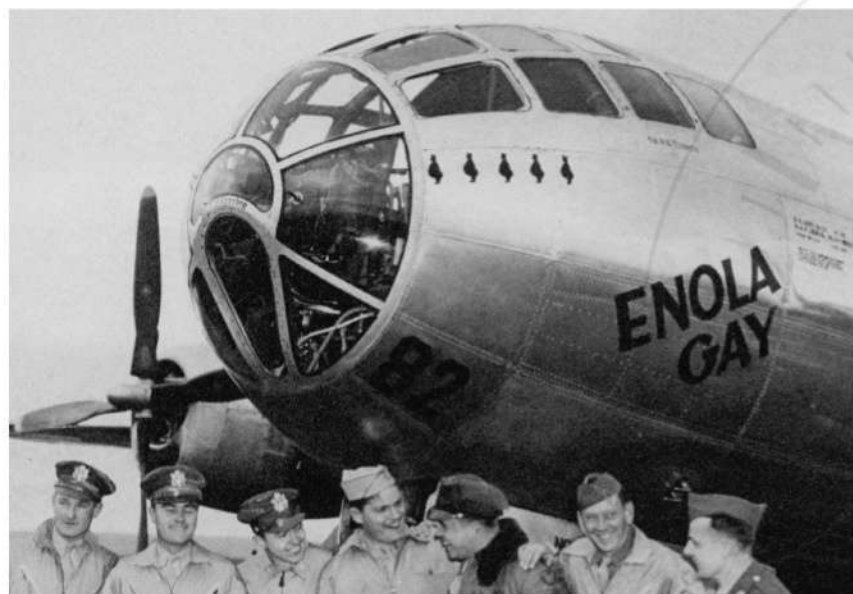
The crew aboard the *Enola Gay* still don't know the mission's goals – observation planes have gone ahead of them to check the lie of the land. They are on the way to the coastal towns of Hiroshima, Kokura and Nagasaki. Hiroshima has priority, but low cloud makes the city a difficult target. *Enola Gay* may have to head for one of the alternatives.

**3.00** In the cockpit, Lewis and Tibbets are still not talking to each other – apart from routine commands. Neither of them mentions the fact that Lewis took over at the last possible moment. In his log Lewis writes: "Everything went well during takeoff: nothing unusual to note".

Over the following few hours, the crew don't have much to do. The plane goes to the island of Iwo Jima first and then towards Japan. Weaponeer William Parsons finds it hard to relax. He taps Tibbets on the shoulder and says, "Are we ready?"

"Control has started", reports Tibbets on the code coming from the radio tower at the Tinian base. Meanwhile, Parsons has reached the bomb room and crawls into it. He is the only one on board who knows that the *Little Boy* is an atomic bomb.

He has had two days to tell the rest of the crew about their cargo's secret content. Without mentioning the words "atomic bomb", he explains: "The bomb, which we have to drop, is something completely new in war history – the most destructive weapon ever made. We believe that it will ►



The world's first atomic bomb was flown to Japan in the hold of the B-29 *Enola Gay*. The big bomber was named after pilot Paul Tibbet's mother.



# Altimeters triggered Armageddon

If the atomic bomb dropped on Japan without exploding, Americans would have given the enemy a terrible weapon to copy. A primitive, but safe, trigger mechanism was designed to prevent possible disaster.

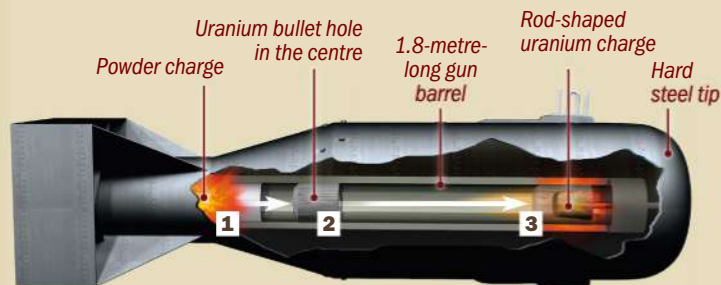


An elevator lifted Little Boy up from its bomb store and into the plane's hold.

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## Gunpowder started a chain reaction

For safety reasons, the amount of uranium in the *Little Boy* is only small as a plane crash or a fire could trigger a nuclear reaction. Only by firing two charges of uranium into each other would the critical mass cause the bomb to detonate.



### Explosions split atoms

**1** At the back was a 38.5 kg projectile filled with uranium. As the powder charge is activated it shoots through the bomb.

**2** The uranium projectile flies through the strong 10 cm diameter gun barrel.

**3** In the bomb tip is a further 25.5 kg of uranium. The clash with the projectile unleashes enough energy for the nuclear reaction to begin.

## Little Boy's specification

Weight	4.4 t
Length	3 m
Diameter	71 cm
Enriched uranium	64 kg
Burst strength of TNT	13,000 t

## Activation at 600 metres gave Enola Gay time to escape.

First, the bomb had to drop to about 600 metres to maximise its damage on Hiroshima, while giving the plane time to get away.

**8-9 km:** when the bomb was dropped, power to the **detonator altimeters** was **disconnected**.

**2,000 m:** once the bomb had dropped down to an altitude of 2,000 metres, **barometric altimeters** kept power precise and four so-called Archie-altimeters measured it.

**565 m:** Archie's measured the time it took for the radio waves to hit the ground and reflect back. At 565 metres' altitude, a **powder explosion is triggered**, which causes the bomb to detonate.



## An accident could have wiped out the largest US airbase

To prevent the atomic bomb exploding prematurely, the power supply to its electronic detonator was interrupted until shortly before it reached Hiroshima. The powder chamber behind the bomb was not filled until the plane was certain that the bomb would not destroy the Tinian base, the largest US airbase.

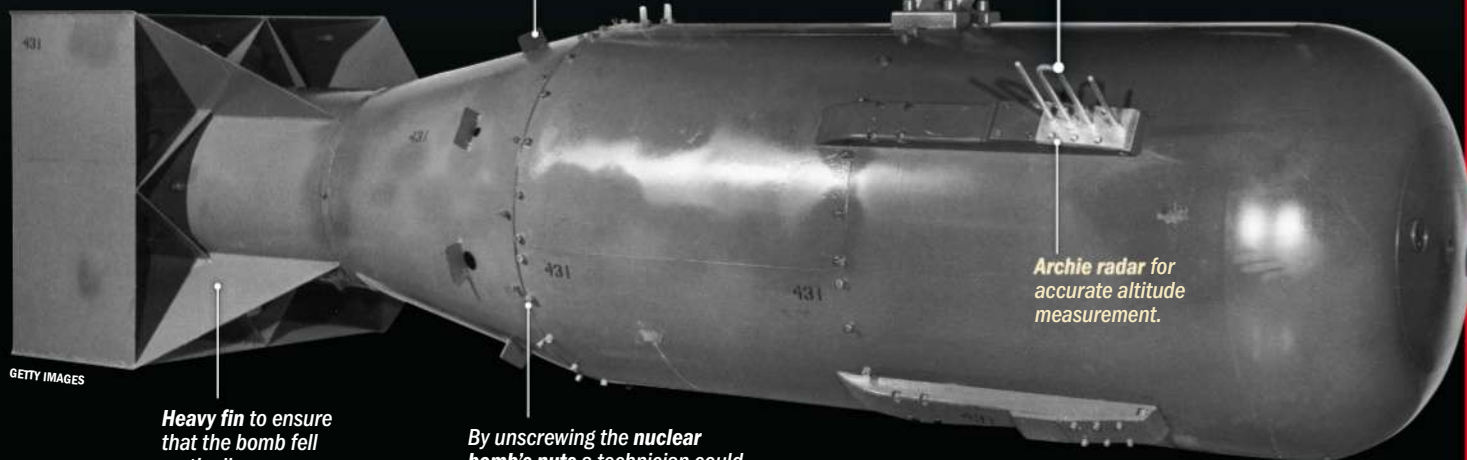


Barometric altimeter.

Archie radar for accurate altitude measurement.

Heavy fin to ensure that the bomb fell vertically.

By unscrewing the nuclear bomb's nuts a technician could enter the bomb during flight.



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CLAUS LUNAU/HISTORIE

NATIONAL ARCHIVES



destroy almost everything within a radius of 4.8 kilometres". On a blackboard behind him, Parsons draws a mushroom cloud, before continuing: "we do not know exactly what will happen when we drop the bomb. It has never been done before, but we expect a cloud like this to form and that there will be a flash of light, brighter than any light from the sun".

*Little Boy* is the result of a gigantic and mysterious developmental work, code-named the Manhattan Project. 130,000 scientists and engineers have been working around the clock to create the atomic bomb. Leading physicists from around the world,

including Albert Einstein and Dane Niels Bohr, contributed to the work. Only a month ago, scientists were finally convinced that their theories held true, following the first nuclear test in a desert in the United States.

At the moment, *Little Boy* is relatively harmless as *Enola Gay* covers the first kilometres of the long trip to the island of Iwo Jima. The bomb has not been armed – a precaution that would prevent it exploding if the *Enola Gay* were to crash on the runway. It is Parsons' job to make the bomb ready.

Parsons is also the only one onboard who knows that the bomb cost as much as it would cost to build as an aircraft

carrier. As he stands and works, the weaponeer looks like a car mechanic and curses as he leans over *Little Boy* as its sharp sheet metal cuts his fingers and rips his T-shirt. He is helped by his assistant Jeppson, who hands him tools and holds a lamp for him.

**3.10** Parsons opens the bomb, accessing the gun barrel that *Little Boy* is built around. At the top of the gun barrel is a charge of enriched uranium, similar to a can of tomatoes.

Behind this is a cavity, which Parsons fills with gunpowder and an electrically operated detonator. When the powder is ignited by an electrical current, the

## Only undamaged cities were bombed

In May 1945, a committee made up of military and scientists had already been appointed to choose the Japanese cities that the atomic bomb might target: any would best show the bomb's devastating force.

According to the committee, potential targets in Japan were designated in advance. The Americans had two objectives for dropping the atomic bomb: "... to achieve maximum psychological impact on Japan and make the first use (of the bomb) so spectacular that the

weapon's importance was internationally known". The cities on their list were Kyoto, Hiroshima, Yokohama, Kokura and Niigata. And the idea was they would be bombed in the order, if weather permitted.

All five cities met the four criteria that the committee and President Truman had

established. Nagasaki was added to the list later, replacing the cultural city of Kyoto after a personal intervention from US Secretary of War Henry Stimson. He had visited Kyoto a number of times and admired the city's many ancient temples.

### Criterion 2: military targets

Hiroshima met this prerequisite thanks to its garrison of about 40,000 men and a large port where supplies for the Japanese army were shipped from.

### Criterion 3: greatest effect

The committee selected cities where massive devastation would be greatest. Hiroshima was surrounded by hills, creating a pressure cooker effect where heat and the blast could not escape.

### Criterion 4: no damage

The city may not be damaged by previous air strikes, so that the atomic bomb's devastation would be visible as possible. Hiroshima had never been bombed before.

### Criterion 1: city

The city should have a radius of five kilometres, to maximise the destructive scope of the bomb.

**Hiroshima after the bomb: only solid concrete buildings remained.**

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charge of enriched uranium will shoot down through the gun barrel and into a cylinder of uranium, setting off the chain reaction, which would activate the nuclear bomb's immense force.

At 3.20, Parsons finishes work on the device. The bomb is almost fully armed. Only three sealed fuses prevent power reaching the bomb so the electric detonator isn't set off accidentally. At the very last moment the engineers will return to replace these three fuses.

**4.25** About half an hour before the *Enola Gay* meets up with the two escort planes at Iwo Jima, Tibbets hands over control of the plane to Lewis and leaves the cockpit.

Most of the crew are having a nap or reading. Tibbets climbs through the long tunnel of the two bomb chambers to the living area at the back of the plane. He greets the men who are still awake with a few soothing words.

When he reaches gunner Bob Caron in the aft turret he says, "Bob, have you guessed what's going on here?"

"Sir, I will not be placed against a wall and shot", answers Caron, referring to the threats that hang over the nuclear programme.

Caron and everyone involved in the development and transport of the atomic bomb risk the death penalty. The project is so secret that Vice President Truman knew nothing about it before 12th April 1945 when he took over the presidency after the death of President Roosevelt.

"Bob. Now we are on the way. You can talk", says Tibbets smiling.

"Is what we have a chemist's nightmare?" asks Caron.

"No, not exactly", answers Tibbets.

"So is it a physicist's nightmare?"

"Yes", answers Tibbets.

"Will we split the atom?" asks Caron.

**4.55** *Enola Gay* meets up with the two B-29s on Iwo Jima. The morning light begins to show and the horizon displays luminous pink against the dark night sky. Tibbets takes back control, pulling up to about three kilometres. The three planes gather in a loose V formation with the *Enola Gay* at the front and as the sun rises, they agree the plan for a hit on Hiroshima.

Lessons learned from the invasion of the islands of Iwo Jima and Okinawa

**B-29s could cover 5,230 kilometres and throw over nine tonnes of bombs.**

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## Six planes ensured mission's success

Americans usually attacked Japan with hundreds of heavily loaded bombers. But the atomic bomb was dropped during a sneak attack with only six planes, all

**Boeing B-29 Superfortresses.** Three flew in advance and checked the weather over the three potential targets: Hiroshima, Kokura and Nagasaki.

*Enola Gay* was followed by **The Great Artiste** and **No. 91** all the way to the target. The two planes would take photos and gather readings using instruments dropped by parachute.

## Enola Gay was custom built

Boeing B-29 Superfortress had long flown missions to Japan, but the 14 Silver Plate versions were built to drop nuclear bombs.

They were 3.3 tonnes lighter because the plane's armour had been removed. Therefore, Silver Plate planes could fly to an altitude of over 9 km – too high for Japanese planes to reach.

### Silver Plate specifics:

- Bomb hatch can be closed extremely quickly.
- Direct gasoline injection provided reliable engines.
- All machine guns close to the back were removed.

earlier this year, had persuaded President Truman to give the green light to the atomic bomb. Japanese resistance on both islands was fanatical because, for the first time, the enemy fought on their home soil.

Analysis of American casualties at Iwo Jima and Okinawa showed that more than 267,000 US troops risked losing their lives, and nearly a million would be wounded during a possible invasion of the Japanese mainland. Therefore, the atomic bomb would save American lives.

**6.30** In just under two hours, the plane is over southern Japan. Assistant weaponeer Morris Jeppson crawls into the forward

bomb chamber. Jeppson's task is to arm the bomb completely. He replaces the three green sealed fuses with three red fuses, which means that there's power all the way from the bomb's battery down to the electric detonator. The bomb will explode when the power is turned on.

Once the fuses are replaced, Parsons crawls towards Tibbets and tells him that his assistant has armed the bomb. Tibbets grabs the microphone to the plane's communications system and finally reveals the secret in the hold to his crew: "What we have, is the world's first atomic bomb", he says into the microphone.

"When we have dropped it, our reactions will be recorded – for ▶

**The crew were provided with welding glasses like sunglasses. They would protect their eyes from the intense flash of light from the exploding atomic bomb.**



**Sunglasses for intense light flash**



posterity – so mind your language, and do not interrupt each other.

“You were right, Bob. We’re going to split the atom. Come back to the tower. We’re ascending”, concludes Tibbets.

**7.24** One of the reconnaissance planes comes on the radio. The B-29s’ sights are set on Hiroshima: “Cloud cover is below 30 per cent at all altitudes. Advice: bomb the primary target”, is the brief message that comes through Tibbets’ receiver.

“It will be Hiroshima”, Tibbets repeats to the crew over the communication system, as the *Enola Gay* rises to eight kilometres’ altitude.

Hiroshima is beginning to wake up. Most of the city’s approximately 40,000 soldiers are outside doing morning exercises, and hundreds of children and young people are deployed to work clearing buildings to create fire breaks leading up to the Aioi Bridge in the middle of the city. *Enola Gay* has orders to aim for the bridge. For the Japanese,

In the event of an emergency landing, everyone had a gun, a safety vest, water purification kit, first-aid kit and food rations.

## Safety vest for emergencies



it’s not unusual to see the B-29 plane in the sky – since autumn 1944, American bombers have been able to reach Japan from conquered bases on the Mariana Islands. What’s special about today is that there are only three.

The attacks on Tokyo in March 1945 had created fear among the Japanese population. Then, over 300 B-29s threw firebombs, killing 100,000 people.

**8.05** 80 kilometres from the Aioi Bridge, *Enola Gay* reaches 9.3 kilometres’ altitude, approaching Hiroshima at 320 km/h. The two support planes hang a few kilometres further back.

In the tower, Caron keeps an eye out for Japanese fighters, but can’t see any on the radar or radio – there are no signs that the Japanese have sent

fighters into the air. In fact, Japanese air defences on the coast have already discovered the bombers, but don’t consider them as a threat.

Caron tries to put on his bulletproof vest, but as he sits wedged behind his guns he fails. Moreover, he’s hindered by the camera as he hurt his hand just before takeoff.

Once the *Enola Gay* has dropped the bomb and is retreating from Hiroshima, Caron is supposed to take pictures of the explosion and the expected mushroom cloud, from his position behind the tail wing.

“10 minutes to target”, comes over the radio.

Weaponers Parsons and Jeppson cast another glance at their control panel. All lights are green. The bomb is armed, and all systems are working as they should be.

**8.12** In the city of Saijo, 30 kilometres east of Hiroshima, an observer spots the three planes in the sky. He makes a field call to the administrative centre in Hiroshima where schoolgirls take the call. They send the message to Hiroshima’s radio station: “Chugoku’s regional military reports on three significant planes, heading west from Saijo. Be on high alert”.

Over the next few minutes, more of Hiroshima’s residents see the planes. The men supervising the fire route to Aioi Bridge blow their whistles and send school children to the shelters.

**8.14** “On with the glasses”, orders Tibbets over the radio, as *Enola Gay* reaches the outskirts of Hiroshima. Nine of the 12 crew members put on their dark glasses. The other three can’t put them on as they need to see clearly to perform their current tasks. One, bombardier Thomas Ferebee, will drop the bomb and needs to keep Hiroshima in his sight. The city, which he only knows from grainy black-

## Fire, heat and radiation killed 140,000 people

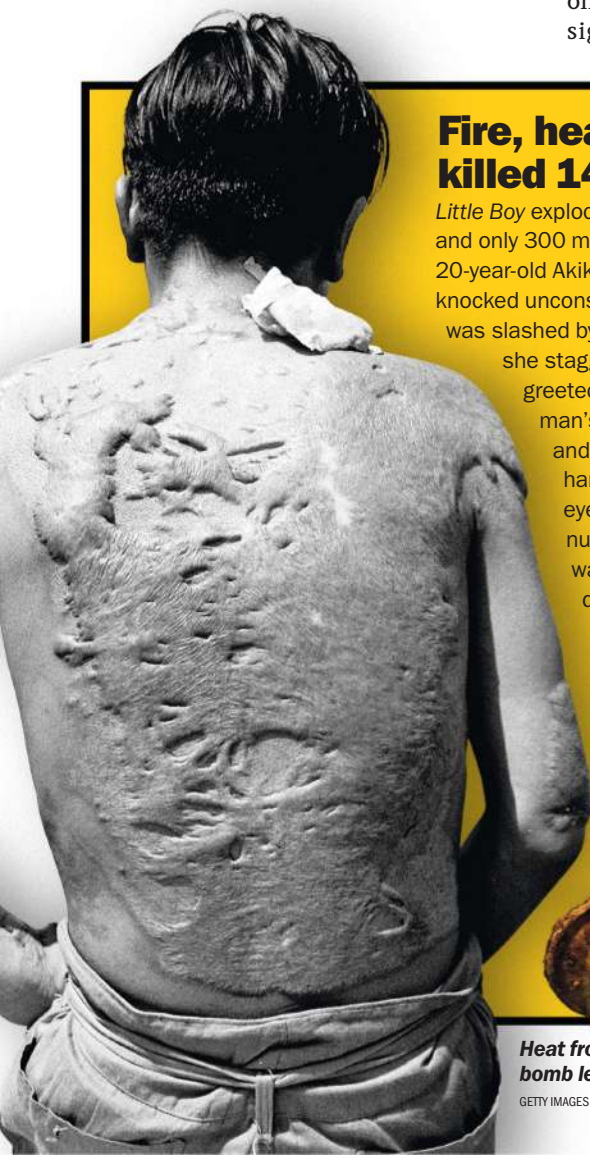
*Little Boy* exploded 565 metres above the ground and only 300 metres from the state bank, where 20-year-old Akiko Takakura worked. She was knocked unconscious by the blast and her back was slashed by shrapnel, but she survived. As

she staggered out into the street, she was greeted by a horrible sight: “The dead man’s fingertips just started to burn, and soon his body burned. I found it hard to breathe, the smoke made my eyes water”. Because of an unknown number of slaves and prisoners of war in Hiroshima, it’s hard to quantify the total casualties, but historians estimate that 140,000 died from the initial explosion or later from radiation poisoning.



Heat from the molten metal of the atomic bomb left survivors with grotesque burns.

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# "We saved lives"

Among Enola Gay's 12-man crew there was no doubt that their bombing raid on Hiroshima saved more lives than the atomic bomb killed. In interviews after the war they showed no signs of doubt or remorse.

*"No one wants to create the kind of devastation we caused. But it was something that had to be done."*

Robert Shumard, Assistant flight engineer

*"War is terrible. War kills and destroys. We all feel bad that people died. We are all humans. But I do not feel bad that I took part in the mission. Had I known the outcome beforehand, I would have flown anyway."*

Richard Nelson, Radio operator

*"Yes, we killed many people, but by God, we saved many lives. And we did not have to invade Japan."*

Paul Tibbets, Pilot

*The crew were photographed on their return to their base on the island of Tinian.*

SHUMARD

NELSON

STIBORIK

DUZENBURY

CARON

BESER

JEPPSON

VAN KIRK

FEREBEE

PARSONS

TIBBETS

LEWIS

*"I was proud to be aboard the Enola Gay. The war ended on 14th August. I wonder if it was connected, what if we had not dropped the bomb?"*

Theodore Van Kirk, Navigator

*"I helped to make the world a better place. No one had dared drop a nuclear bomb before. This is how I want to be remembered. As the man who helped, it was like that."*

Robert Lewis, Co-pilot

and-white reconnaissance photos, is now in full view.

The contrast between the images is great. Hiroshima is bursting with colour with its green gardens and parks, blue water bays and brown rivers. Ferebee sees the Aioi Bridge approaching in the crosshairs. He makes the final adjustments and turns on the signal.

It is an automatic system where a simple computer makes fine adjustments in the last 15 seconds and then drops the bomb. The system emits a continuous humming sound. The two planes behind the *Enola Gay* prepare to complete their mission. One will

photograph the devastation and the second will drop measuring equipment by parachute, designed among other things to record the powerful blast caused by the bomb.

**8.15** At exactly 8:15:17, *Enola Gay* releases the bomb, and *Little Boy* falls out.

"The bomb has gone", shouts Ferebee. He closes the hatch and looks out through the bottom of the plane's Plexiglas dome. He watches as *Little Boy* falls. For a moment, it seems as if it is still in the sky – as if linked to the plane by invisible strings – but then the bomb continues its fall to the ground.

The huge, heavy metallic object sways slightly from side to side as it makes its downwards descent.

Suddenly relieved of its 4.5-tonne load, *Enola Gay* drops through the air, forcing Tibbets to throw the plane hard right as it plummets. The manoeuvre is so wild that the crew cannot move and have difficulty talking because of the enormous g-force exhibited on their bodies. With great effort, Tibbets squeezes out a few words as he shouts for Caron in the aft turret, to see if he can see anything. Caron only manages to stammer, "Nothing".

*Enola Gay* continues its dramatic manoeuvre to put as much distance ▶

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# The atomic bomb was sharply criticised

As the world learned of the enormous casualties, the bombings on Hiroshima and Nagasaki led to an emotional debate. Could the Americans have limited itself to simply threatening a bomb?

## The atomic bomb was necessary because...

- + The USA **avoided invading Japan's main islands**, which would have cost the lives of hundreds of thousands of Allied soldiers – plus millions of Japanese soldiers and civilians.
- + The war was quickly over, and the United States **saved the Japanese civilian population** from a conventional bombing, which could be as lethal as an atomic bomb. For example, 100,000 people were killed in Tokyo during the attacks with firebombs in March 1945.
- + Japan's civilian **population escaped famine**, which would have resulted from America's sea blockade and prolonged bombing.
- + Western Europe was saved from the Soviet invasion. In 1945, **Stalin had an a plan**, but according to some historians, he was **discouraged by the atomic bomb**, which the Russians didn't have yet.
- + A Japanese **A-bomb was prevented** (after the war the US discovered that the **Japanese nuclear programme was far behind** their own).

## A waste of human life, because ...

- + The Japanese navy and air force were **almost obliterated**, and therefore Japan was already beaten. An effective blockade would have **forced Japan to its knees** and made an invasion unnecessary.
- + **Japan's last hope was shattered** when, on 8th August, the Soviet Union declared a state of war – the day before Nagasaki was bombed. The Japanese would accept tougher peace terms against the **prospect of war against** two great powers.
- + Americans should have blown the bomb up in a place with fewer civilian casualties. It would have convinced the Japanese generals that their **country risked being wiped out**.
- + It was **morally unacceptable** to use such a potent new weapon against civilians. To hit the innocent to achieve political objectives is called **state terrorism**.
- + Science did not know enough about the **bomb's destructive power** for them to risk using it.

as possible between the plane and the explosion in Hiroshima. When *Little Boy* reaches around 600 metres altitude, the power will turn on automatically and trigger the nuclear bomb's electric detonator – no matter how close the plane is.

While the bomb continues to fall, the *Enola Gay* completes her manoeuvre. Tibbets lifts the plane up and pulls his goggles down over his eyes but removes them again when he realises he cannot see anything with them on. Ferebee takes off his glasses too.

In the back, Caron continues to wear his glasses, trying to fix his camera, but it's hard when you cannot see anything. Tibbets asks him again if he has anything to report.

"Nothing", he says again.

While the bomb hurtles towards the ground, barometric altimeters measure how far down it has reached. When the bomb is about two kilometres above the earth, the radar-controlled altimeters switch on. They're very precise and should trigger the detonator when *Little Boy* is about 600 metres above the ground.

43 seconds after the atomic bomb has left *Enola Gay*, it's down to the desired height, and the bomb explodes, 250 metres from its target of Aioi Bridge in the centre of Hiroshima.

**8.16** In the first milliseconds after detonation, a lightening flash appears that expands to the size of a 100-metre-wide fireball.

Directly under the bomb, the temperature rises to several thousand degrees. A man on a stone staircase melts, leaving only a dark spot on the

**Both Japanese troops and millions of civilians were willing to sacrifice their lives against a US invasion.**

GETTY IMAGES





top step. A deadly heat wave sets all buildings, animals and humans within a distance of 1.5 kilometres on fire. School children's knee-high stockings burn into their skin, and men's hats melt down through their scalp.

Inhabitants three kilometres away are burned severely. Of the city's approximate 320,000 population, over 80,000 die instantly.

Even wearing safety glasses, Caron had to close his eyes when the flash hit him. From his position at the rear of the plane, he is the only one who can see the flash directly. When Caron opens his eyes again, the flash has disappeared, but now all he sees is "hell", as he describes it.

While sweeping wildfires develop in Hiroshima, Caron sees a high and seething mass of purple and red flames amid a plume that rises miles into the air. A ring of compressed air forms around the pillar of fire and expands sharply on all sides.

Caron tries to shout a warning, but the others cannot understand what he says. The shock wave hits the plane throwing it around. Tibbets clings to the joystick. But although the blast rips into the plane, it's the noise that really unnerves the pilot.

The crashing sound is reminiscent of flak fire from the German 88-mm guns, which he witnessed during bombing raids on Nazi Germany.

Tibbets thinks that Japanese anti-aircraft guns are shooting at them.

"Flak", he shouts.

Four seconds later, Caron warns them again: "Another one is coming".

Once again, *Enola Gay* is lifted into the air by a huge shock wave and flung around the sky. The plane is about 14 kilometres from the middle of the explosion, but although the shock wave is strong, the B-29 can withstand its impact. And as soon as the second shock wave has passed, the plane remains quiet again in the air.

"Okay. It was the reflecting shock wave that was sent up from the ground. There will be no more. It was not flak. Stay calm", Tibbets apologises and orders all crew members to take turns telling what they saw, so their stories can help to document *Little Boy's* impact.

Caron says: "Fires have broken out everywhere down there. I tried to count them – One, two, three... 14,



Hiroshima's exhibition centre was not rebuilt after the war. The building is called the A-Bomb Dome and is part of the city's peace park for the victims of the atomic bomb.

15... But there are too many. I've seen the mushroom-shaped cloud that Parsons told us about. It is like boiling syrup – and perhaps a half to two kilometres wide. It rises into the sky and is almost as high as us now".

*Enola Gay* circles around about 17 kilometres from the city and the crew can see the mushroom cloud looming in front of them. Meanwhile Caron takes pictures with his camera.

Tibbets corrects the plane's course and then the *Enola Gay* circles around the whole city three more times to inspect the bomb's impact.

Co-pilot Lewis, whose first reaction to the bomb was to scream, is now sitting, buried deep in thought. Like the rest of the crew he tries to digest the dramatic impact, while *Enola Gay* quietly flies back to the base on Tinian. In his logbook Lewis notes: "My God. What have we done?"

The same day, President Truman informs the American people about the atomic bomb. "A short time ago, a US

airplane threw one bomb on Hiroshima, and destroyed its usefulness to the army".

The president says nothing about the tens of thousands of civilians who are dead or dying in the city's smoking ruins. But Truman knows that the target was a city, and that the bomb must have killed civilians.

Yet he does not hesitate. The order to drop another nuclear bomb has already been given. The Japanese have only three days to surrender, and when Japan is unresponsive, the US will also obliterate the port city of Nagasaki with a second atomic bomb on 9th August. Early the following morning, the US receives the Japanese government's surrender – fighting in Asia is finished, and WWII has finally ended. ■

#### FURTHER READING

● Gordon Thomas & Max Morgan-Witts: *Enola Gay: Mission to Hiroshima*, Dalton Watson 1995 ● Michael Kort: *The Columbia Guide to Hiroshima and the Bomb*, Columbia University Press, 2007 ● Richard H. Campbell: *The Silverplate Bombers*, McFarland, 2005



If the plane got into trouble, the pilot had been ordered to hand out suicide pills. The crew had to swallow the pills to avoid the torture they would face if the Japanese found out that their flight was carrying an atomic bomb.

Cyanide suicide





# EVENTS THAT CHANGED THE WORLD

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Mongol ruler Genghis Khan took just 25 years to build the world's greatest empire.

### POWERFUL MEN

The Wall Street crash led to economic chaos.

### DRAMATIC DISASTERS

### PIONEERING INVENTIONS

The assembly line meant mass production of cheap cars.

### GREAT BATTLES

Germany's invasion of Poland triggered the Second World War.

The atomic bomb dropped on Hiroshima in 1945 created an inferno that changed the world forever. The invention of the steam engine in 1712 drew thousands to new towns and cities to work in factories. Spanish flu took over 50 million lives in 1919, while the Wall Street Crash of 1929 caused an economic crisis that would lead to WWII ten years later. This special issue focusses on those crucial moments that sparked wars, disasters, epidemics and pioneering inventions.